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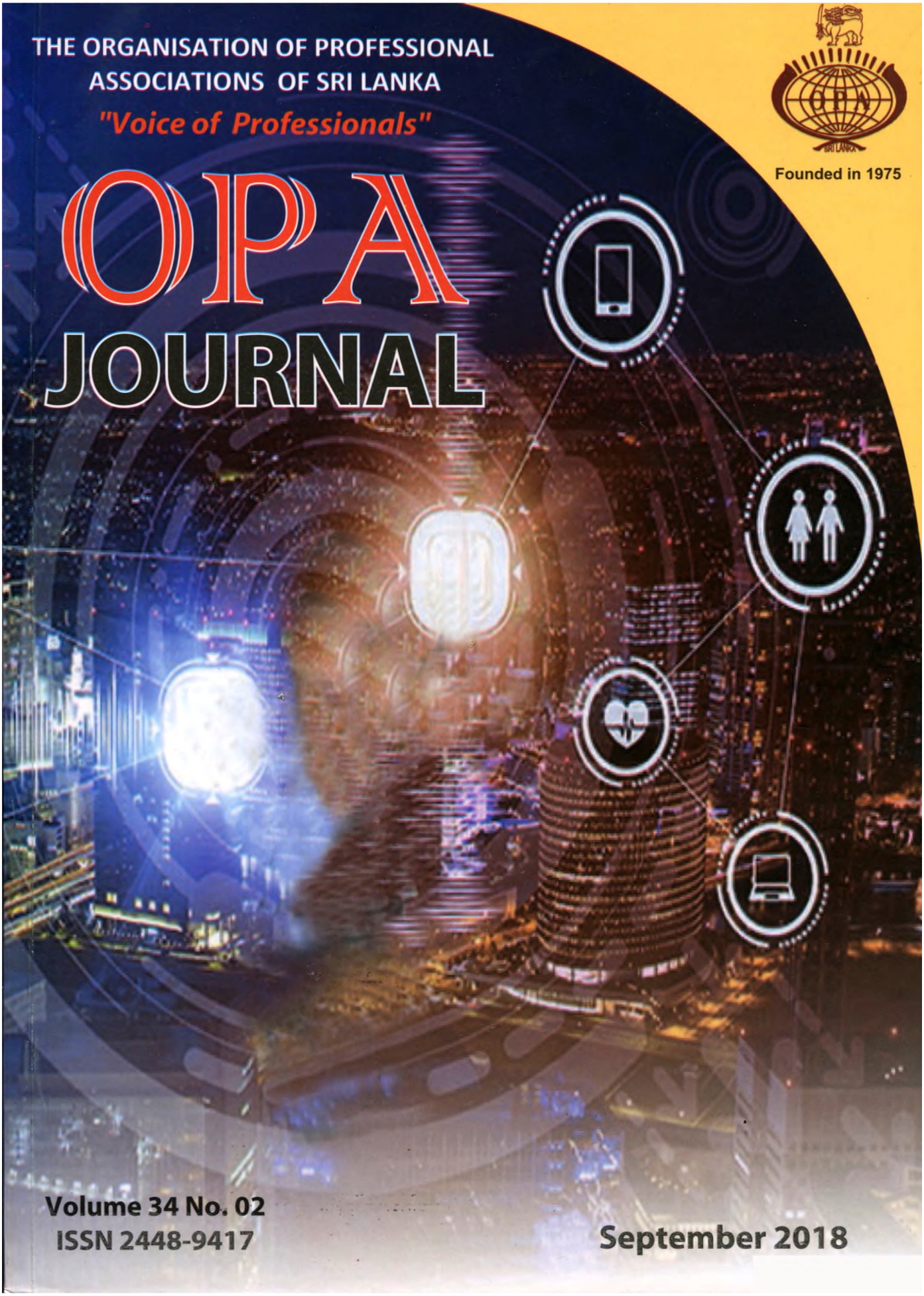
OPA JOURNAL



Volume 34 No. 02
ISSN 2448-9417

September 2018

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OPA Journal

September, 2018

31st Annual Conference Publication

INNOVATIVE DIGITALIZATION

Editor : Eng.Upali Jayawardena

OPA
Journal

A Publication of the
Organisation of Professional Associations of Sri Lanka

September 2018, Volume 34 No 02

Editor : Eng. Upali Jayawardena

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Printed by
Brilliant J. Printers
276/1 Old Kottawa Road,
Mirihana,
Nugegoda.
Telephone : 071 - 3129243

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From the Editor

MODERNIZATION AND SUSTAINABILITY

Eng. Upali Jayawardena

We already know that modernization means replacing old and outdated methodologies with modern, up-to-date ones. But what is sustainability? It can mean "the ability to be maintained at a certain rate or level" or the "avoidance of the depletion of natural resources in order to maintain an ecological balance". In the professional world, it is the former version that holds sway, but there are many instances when sustainability is important in an environmental sense. The two definitions and aims can often overlap. But in both cases, the implicit idea is that we do it for posterity.

In other words, modernization is useless if it is not sustainable. We have to think of the future when modernizing our work environment. We have already focused on digitalization as a tool for modernization– incidentally, digitalization happens to be a sustainable solution as well. For example, digitalization can help reduce the paperwork in your workflow, thereby reducing the burden on the environment. This is sustainability in action.

Going for sustainable solutions can sometimes be expensive. That solar power plant for your new office complex could add millions of rupees to your costs, but it will pay for itself in the long run through net metering et al. Here, the benefits may not be apparent immediately either physically or on the balance sheet because traditional modeling and cost-benefit analysis have always been weighted in favor of things as they stand. Sustainability is sometimes portrayed as a risk, but it is one that is worth taking. The problem is that costs of new, more sustainable systems are readily apparent, but their second and third order benefits are difficult to predict or quantify.

Sustainability may not work in a "here and now" situation. But any fundamental shift toward sustainability is enjoyed by all subsequent users or members of a given entity. If you find sustainability to be a hard sell among your colleagues, show how bad things will be if you do not opt for sustainable solutions without delay. These days, it is almost impossible to make sustainability look like a bad deal, though.

Since sustainability is sometimes also about responding to projected or future needs, it is advisable to proceed with caution too. If you build a multi-storey car park for your new complex and if autonomous cars make parking redundant in say, 20 years, that project will not have much of a future. In fact, many new buildings in countries such as Singapore have deliberately cut down on parking spaces to encourage ride sharing and public transport. However, some things like the aforementioned digitalization will bring results now and in the future.

Sustainability needs laws and frameworks to succeed at a national level. Organizations such as the OPA can play a critical role in this regard by having a dialogue with the law makers and opinion makers. Industries and professions can also study how other countries have tackled sustainability in the process of modernization. Sustainability is not new either. It may be a buzzword now, but there is evidence that we had practised it since ancient times. Our irrigation systems, which already feature today's sustainable technologies such as rainwater harvesting, are one example.

Sustainability should be an essential part of modernization. After all, it is about using the available resources in a non-exhaustive manner with future needs in mind. It also tallies in with the concept of environmental protection. No organization or profession can thrive without strong environmental credentials in today's world. It also sends a message to the world outside that you really care about the environment and the planet. It is a win-win situation for everyone.

INNOVATIVE DIGITALIZATION

***Eng. Indika* Alahapperuma**

Digitalization is a buzzword that we often hear and read. Digitalization, sometimes referred to as Digitization, refers to "the process of converting information into digital formats". It can also loosely refer to the act of moving from an analog technology to a modern Information Technology mechanism. Digitalization in this regard would mean, becoming modern technology-compliant in our processes. Digitalization is also about the use of digital technologies to change a work or business model and provide new revenue and value-producing opportunities. It is the process of moving to an entirely digital workflow.

In a world essentially run by computers, digitalization is becoming the norm rather than the exception. No entity can survive without some element of digitalization in its work processes and public interaction. The most visible face of digitalization is not the desktop or the laptop, but the smartphone which almost everyone uses 24/7. With apps for everything from banking to project reports, the smartphone is the face of digitalization. That is not all – with 5G on the way and the Internet of Things (IoT - smart devices connected to each other) becoming a reality, digitalization will be a way of life.

Digitalization is vital for all professionals from engineers to doctors. It has already made life easier for all professionals both in the field and the office. Digitalization has replaced most, if not all, of the manual work in most professions. This has increased efficiency and productivity across the board. Digitalization has made it easier to find and rectify faults in various projects, which is a major advantage over manual approaches.

But digitalization has become so commonplace that we now take it for granted. There is hardly any differentiation between the various processes of digitalization that we witness every day. This is why "being different matters", to paraphrase one of the most famous catch lines of Steve Jobs. The answer is innovation - defined simply as a "new idea, device or method". Innovation is often also viewed as the application of better solutions that meet new requirements, unarticulated

needs, or existing needs. Hence the term, "innovative digitalization" to denote new concepts and ideas in digitalization.

These new concepts and ideas are emerging in several key sectors of digitalization including Robotics, Quantum Computing and Artificial Intelligence (AI), Cloud Computing, Internet of Things, Augmented and Virtual Reality (AR and VR) and 3D Printing. Innovation in these sectors is bringing fresh perspectives to the work of professionals . For example, Architects and Civil Engineers can now walk their clients through buildings that exist only on paper, thanks to the wonders of VR. But innovation in digitalization does not have to be fancy stuff – any digital process that speeds up planning, problem solving and logistics will be adequate. Some innovations may not even cost any money at all to develop, but save lots of it once utilized.

We need digital innovation labs in our universities and research institutions to fast-track innovations in digitalization. Many other countries have similar labs for Research and Development (R&D) in digitalization. Sri Lanka has many young innovators who excel in a variety of sectors. They should be co-opted to deliver innovative solutions for digitalization. Collectively, innovations in digitalization are believed to lead to what the press has termed as "Industry 4.0", an euphemism for the "Fourth Industrial Revolution". Professionals will play a leading role in his digital-driven transformation based on the concept of Inter-operability - the ability of machines, devices, sensors, and people to connect and communicate with each other. The digital future is already here – we will need a healthy dose of innovation to get ahead in that future.

AN ENGINEERING ERA???

Eng. G. A. M. A. Wijethunga
Executive committee member
Association of Public Service Engineers
(For Association of Public Service Engineers)

As Sri Lankans, we are immensely proud of our achievements in the past. Our written history over 2,500 years, exports during "Parakum Era", "Ellanga" water management system in monarchy era etc are top topics. But in the last paragraph of the story, we are not forgetting to include the ever heard sentence "Sri Lanka is a developing country".

Actually where are we ? Are we in a position that we are supposed to be? At least, are we on a way to reach to a better status of development? Intellectuals and professionals of the country shall ask these questions from themselves. In other words, we shall ask these two important questions from ourselves. It is the sincere responsibility of true professionals.

As per His Excellency the President, more than 10,000 Engineers, who obtained their basic degree locally, are working aboard. As a trade union of engineering professionals, as officers facing real truth on the ground, we have no other option than agreeing with HE the President. Unfortunately the trend is increasing rapidly. In a broader view, other professional disciplines, such as Medicine, Accounting, and Management demonstrate same trend, though the numbers may vary from one profession to other. As a country, can we survive with this trend? Then, the important question is "how we can change the trend?" We all have to sit together and find a sustainable solution for this question and simply apply "Engineering". In other words "creating things that never been."

First let's see the green lights on this topic. His Excellency the President has flashed green lights in several occasions. HE has named the "Moragahakanda Reservoir" as "Kulasinghe Reservoir" honoring a legend of Civil Engineering late Dr. A.N.S. Kulasinghe. In another point of view, it was one of the greatest honor received by a professional in Sri Lanka, highlighting a massage, "If you worked for the country, you will be honored in future". We can take this as an indirect invitation for professionals, who are shining in the sky of foreign countries to return to their motherland and work. Later HE directly invited Engineers, working abroad, to come back to Sri Lanka and work for new development projects. As per HE's statement, main barrier for progressing the development projects at planned rate is the lack of Engineers. However we must not forget that more than 1,500 Engineers are passing out from local universities annually and about 95% of them are getting employment equal or higher to their expectation, before their convocation. Most of them are leaving the country after serving few years in those positions.

According to Government policy document to achieve "Sustainable development goals" and "Vision 2025",

knowledge based economy will be the backbone of the future developments. Engineers, intellectuals and professionals will be the key role of such an economy.

Anyway, when we carefully look at the things around, one can see another side of the story. Let's have a look at.

Over last 3, 4 decades, there is a rapid growth in the foreign aided development projects in the country. In the early stages, foreign consultants were engaged in feasibility studies, design, planning, construction and operation of large development projects. But immense opportunities were given to local Engineers to gain adequate knowledge and experience in the modern technologies. Later they were able to handle similar projects without any foreign involvement. Best examples are Deduru Oya, Rambakan Oya, Weheragala, Wa Madilla, Uma Oya downstream reservoirs being constructed and Mau Ara multi-purpose development projects done by the Department of Irrigation, saving more than 10 billion of Sri Lankan Rupees. Actually the biggest advantage is not the saving of money, but the flow of the knowledge and experience to the bottom level and enhancing economic activities of the local people from the project implementing stage. But recent past, scenario has changed. Most of projects were executed on EPC basis. Though the Cabinet has decided recently to change the system to so called "Swiss Challenge", there is no much difference when considering the final outcomes.

EPC is simply Engineering, Procumbent and Construction. In other words, total project is handed over to a foreign company and become an observer. Primary feasibility study and environmental impact assessment too are done by the foreign proposer. Importantly, most of the times identification of the problem is done by the proposer and they have the power to decide the priorities. Based on the results of the preliminary studies, proposer is carrying out the Engineering design part of the project. Sad thing is all the estimations and budgets are prepared not based on local rates. It is as per the proposer's rate. What will happen to the Government accountability and responsibility? Please remember, observers no authority to interfere to this process. Next step is funding. This is also done by the proposer. He will find a suitable funding source, most probably a commercial loan from a commercial bank of the contractor's country. Finally proposal will come up with a huge budget and sometimes with bad solutions. But these companies are experts on marketing. Those people will put some icing on the cake and present to the policy makers and executers and use unspoken ways to get the approval for the project. Then are project moves to the procurement stage smoothly. Finally, procurement process will be ended up on the favor of the proposer. Successful bidder will definitely be from the country of the proposer. Then at the construction stage, most of the time, all the staff, from engineer to labor will be imported from contractor's country. If not, sub-contracting the whole project for low rates, enjoying higher profit margins. Finally we have to pay back the loan with interest, even though the higher percentage of loan amount is paid to proposer's country. However most of these projects are targeting problems for which local experts can easily find reliable, sustainable, and much better solutions. And most importantly it would not be

much difficult to find funding for implementing most of those development projects locally, at local rates using local resources if policy makers and professionals are really interested to do so. Such an approach would definitely be contributed to develop the country giving the real benefits to the society.

Let's see another passage of the tragedy. Most of social, economic and environmental, even political problems become complex as there are inputs and constraints from different disciplines. Therefore solutions have to be found in a multi-disciplinary approach in order to the project to be sustainable. But unfortunately it is not happening in Sri Lanka, because of the monopoly of some policy executors. There are lots of examples and few of them we can discuss here. "e-governance" is one of the large projects initiated in recent past to enable citizens to access government services through internet. Main objective of the project is to reduce the time taken to provide the service and reduce the number of receivers physically appearing on service points to receive the services. Even though the correct resource persons were engaged for ICT part of the project, no one to apply "Process Engineering". What was the result? Only few steps of the whole process is open to the internet, such as distribution of data and payments but important steps such as data uploading was not opened. People have to take printouts of online payment receipts and submit with other relevant documents, physically to the service points. Even though there is little reduction in process time, people still need to appear physically to get the services. Only after experiencing this scenario for few years, they started to open these forgotten steps. But still not applying "Process Engineering", just doing by experience.

This is also linked with the transportation problem of the country. Because most of the time, people have to move physically here and there to provide and receive services. Transportation experts are working on increasing the availability of transportation sources and accessibility, while proposing steps to reduce the demand for transportation and change the pattern of demand. But unfortunately authorities who are responsible for executing those steps are not ready to execute expert's proposals.

Similar problem was in the power generation sector, but as this sector is operated and managed by professionals, they were able to control the situation. Steps were taken to increase the supply and also to reduce the demand and move peak loads to off peak times to balance the system. Therefore we are far ahead in the electricity supply system compared to Asian countries.

There are hundreds of similar examples, we can discuss. We shall understand the value of professionals and professionalism. True professionals always accept the professionalism of other professions. But unfortunately, most of the times, we are not experiencing the same in our country.

Anyway as professionals, it is our sole duty and responsibility to create such society and move for inter disciplinary solutions to make a better future. In other words, we have to create things that have never been. Then only "Engineering Era' will begin.

DIGITALIZATION IN MOBILE REVOLUTION

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Mobile networks have evolved over the years to the present day. It began as early as the mid 1940's ranging to late 70's - zero (0G). This technology was referred to as mobile radio telephone. This technology used, essentially analog radio signals with switch board operators required to connect calls. For most of the life span of 0G, its commercial use was primarily limited to install in vehicles as it was very large. Progressing to early 70's, 0G became truly mobile as the technology was miniaturized enough to be carried by a person and switch board operators were no longer required. A few years later in 1981, the first generation of mobile networks were established with 1G. Radio technology was miniaturized to fit inside a single device where no wires were protruding, allowing communication devices to take on a more mobile phone square shape. 1G like 0G still was using analog signals, so was limited to just transmitting voice with speeds up to 2 Kilobits per seconds (Kbps). Progressing towards the early 1990's, in 1992, 2G was introduced. At this point mobile phones, were small and affordable enough to garner massive attention from the public which kick started the mobile phone revolution. 2G introduced digital standards short text messages (sms – 1992) to be sent and at speed ranging from 14 to 64 kilobits per seconds (Kbps). As the network matured from 2.5G (internet on the move in 1997) and 2.75G (High speed data in 1999) speeds saw increases up to 144 kilobits per second (Kbps). Moving forward roughly another 10 years, in 2001, 3G made its debut. 3G was first Mobile Broad Band solution and integrated high quality video, data and voice essentially bringing the mobile phones online with speeds initially ranging from 384 kilobits per second (kbps) to 2 megabits per second (Mbps), with 3G adoption of mobile phones spread like wild fire, initially only for a product for the older generations began to be purchased and given to children as well. As 3.5G and 3.75G standards were rolled out, speeds saw upgrades ranging from 2 megabits per second to 10 megabits per second. Once again progressing 10 years to 2011 we arrive at our current generation of mobile networks 4G LTE, a true mobile Broad Band solution where other generation of mobile networks have added new functionality to our devices, 4G's primary purpose has been to bring faster speeds. This generation has created a world that truly revolves and connects around the mobile experience. Long Term Evolution (LTE) is the first phase of 4G with the minimum speeds of 10 megabits per second (Mbit/s) to a theoretical 100 megabits per second (Mbit/s).

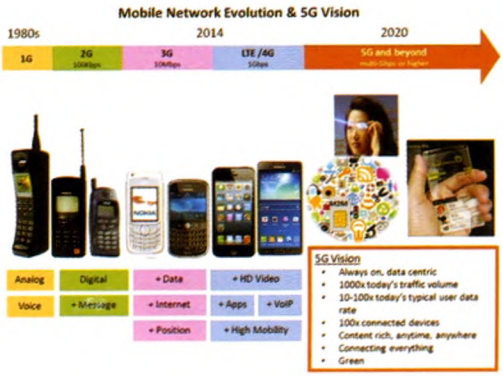
This was the first phase of 4G simply known as LTE and Release 10, 11 & 12 from 2011 to early 2015 were about creating the standards for a true 4G mobile network with LTE – Advanced. With LTE-Advanced we see the beginning of the core 5G

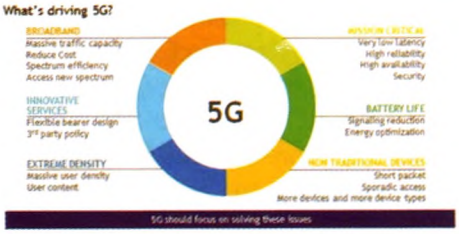
technologies such as small cell deployments and MIMO.

Before we start to discuss Release 13 to 16 the start of the true transition to 5 G it is worth some more time understanding 4 G speeds have sucked up until now,

4G LTE advertised speeds up to 100 megabits per second (Mbps), and LTE – Advanced speeds up to 01 gigabits per second (Gbps), however for the life span of 4G thus far, speeds for the majority of people have averaged only 10 to 50 megabits per second (Mbps). The primary reason why speeds are so atrocious is that 3G and the initial standards for 4G were not designed with a mobile future in mind. The amount and the growth of devices have out phased the technological ability to support them. In fact it is a cruel paradox, the more devices that have come on line the slower the network has become, making advertised speeds unreachable. Secondly much of the new infrastructure required to bring noticeable improvements in speed comes with the deployment of LTE Advancement Pro. LTE A Pro began with release 13 and is the final phase of the fourth generation mobile networks. It will be what carries us in to the 5th generation bringing major noticeable improvements in the coming years.

Evolution of 4G is highly correlated with 5G technologies.



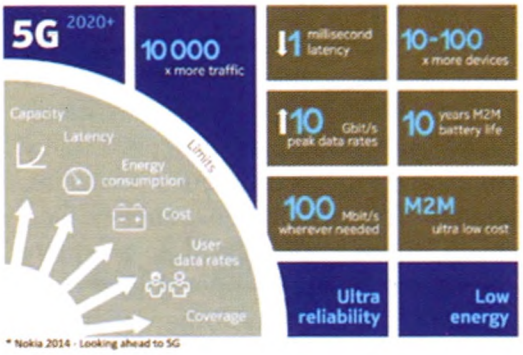


Aim of 5G

- Data Rate > 10 Gbps
- Cell edges > 100 Mbps
- 1 millisecond to end latency – time to communicate and relay back

Expectation of 5G

- 1000 X times capacity
- 10 to 100 times more connected devices
- Latency
- 90% Energy saving



However in order to do this requires many technologies and communication techniques working together in unison.

Technologies Used

- Millimeter waves
- Small Cells – Energy efficient antennae
- Massive MIMO
- Beamforming
- Full Duplex

Millimeter waves

Our smart phone and other electronic devices use very specific frequencies on the radio frequency spectrum typically under 6 GHz, but these frequencies are starting to get crowded, carriers can only squeeze so many bits of data on the same amount of radio frequency spectrum as more devices come up on line, we are going to see slower service and more dropped connection. The solution is to open up some new real estate so researchers are experimenting with broadcasting on shorter millimeter waves those fall between 30 GHz and 300 GHz, this section of spectrum has never been used before for mobile devices and opening it means more bandwidth for everyone.

The increases in bandwidth due to the spectrum being opened up by millimeter waves have better spectrum utilization and will allow expandability of billions and even trillions of connected sensors and mobile devices. They will also enable support of up to 01 million devices per square kilo meter range with no impact on connectivity opening up the territory for smart cities, shared better-quality experience and much more, but there is a catch, millimeter waves cannot travel well through building's or other obstacles and as they tend to be absorbed by plants and rain, and to overcome this issue we use small cell technology.

Small Cell - Energy Efficient Antennae's

Small cell networks - today's wireless networks rely on large high powered cell towers broadcast their signals over a long distances but at higher frequency millimeter waves have a harder time travelling through obstacles which means if you move behind one, you loose your signal. Small cell network should solve that problem using thousands of low powered mini base stations or antennae, these base stations would be much closer together than traditional ones, forming a sort of relay team to transmit signals around obstacles which would be especially useful in cities as the user moves behind an obstacle, his or her smartphone would automatically switch to a new base station in a better range of his devise allowing him to keep his connection.

Multiple Input Multiple Output - MIMO

Today's 4G base stations have about a dozen ports for antennae that handle all cellular traffic but massive MIMO base can support about a hundred ports this could increase the capacity of today's network by a factor of 22 or more of course massive MIMO comes with its own complication, todays cellular antennae's broadcast information in every direction at once and all of those crossing signals could cause serious interference to overcome this we use Beam forming.

Beamforming

Due to the efficiency of beamforming only sending when and where needed will have significant impact on energy consumption. For consumers it equates for longer battery life for their devices with 5G requiring 90% less energy than 4G. A 4G network requires one (01) mill joule (mJ) of energy to transfer 1,000 bit data packet of data. 5G network will be able to do the same in just (0.01) mill joule (mJ). It like a traffic signaling system for cellular signals, instead of broadcasting

in every direction, it would allow base station to send a focus stream of data to a specific user, this specific precision prevents interference and is way more efficient, that means station can handle more incoming and outgoing data streams at once. Here's how it works, say you are surround in a cluster of buildings and you are trying to make a phone call, your signal is ricocheting (bouncing) off surrounding building and interfering with other signals from other users in other areas, a massive MIMO base station receives all of these signals and keeps track of the timing and the direction of their arrival, then it uses the signal processing algorithms to triangulate exactly where each signal is coming from and plots the best transmission route back through the air to each phone , sometimes it will even bounce individual packets of data in different directions off the building or other objects to keep signals from interfering with each other, the results is a coherent data stream sent only to you which brings us to technology full duplex.

Full Duplex

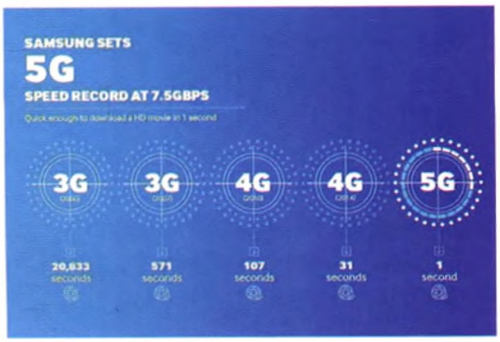
If you ever used a walkie-talkie (hand held two way radio) in order to communicate you have to take turns to communicate and listening that's a kind of drag todays cellular base stations have an exact same hold up the basic antennae can only do one job at a time either transmit or receive, this is because of a principle called reciprocity which is the tendency for the radio waves to travel both forward and backward along the same frequency. To understand this, help to think of a wave, like a train loaded up with data, the frequency it is travelling on is like the train track, if a second train trying to travel in the opposite direction, you are going to get some interference or collision, up until now the solution has been for the trains to take turns or to have separate tracks or frequencies but you can make things lot more efficient by working around reciprocity, researchers have used silicon transistor's to create high speed (1 GHz) switches, that halt the backward role of these waves, it's kind of like a signaling that can momentarily re-route two trains, so that can get past each other, that means a lot more getting done a whole a lot faster.

SERVICES OFFERED BY 5G

- Super Real time connection
- Good for online gamers
- Virtual Reality
- Autonomous driving - Self-driven car possible
- Intelligent transport
- e-health - real time communication with doctors and remote operations with robotics assistance
- Development of smart cities
- provide a platform for Internet of Things (IOT)
- Ultra-Broad band and pipe networking system - zero distance
- High speed data - Big Data service and Cloud data

For example **to download a two hour film** on average,

- 3G - it takes about 26 hours (total time 26 hours)
- 4G - it takes about 6 minutes (total time 6 minutes)
- 5G - it takes about 3.6 seconds (total time just over 3.5 seconds)



But it is just not internet capacity that will be upgraded, response times will also be much faster. The 4G network responds to our commands in just under 50 milliseconds average 4G latency signal. The 5G network will respond in 01 millisecond, 400 times faster than the eye.

Smartphone users will enjoy a more streamlined experience, but for a world that is increasingly dependent on the internet just to function, a reduction in time delay is critical.

Self-driving cars require a continuous stream of data, the quicker that information is delivered to autonomous vehicles, the better and safer they can run. For many analyst this is one just example of how 5G can become the connective tissue for the internet of things an industry that is set to grow three fold by 2025 linking and controlling not just robots, but also medical devices, industrial equipment and agricultural machinery.

5G will also provide a much more personalized web experience using a technique called network slicing. It is a way of creating separate wireless network on the cloud. Allowing users to create their own bespoke network.

For instance an online gamer needs faster response times and greater data capacity than the user just wants to check their social media. Being able to personalize the internet will also benefit the business.

So when can we expect consumer to use 5G, not until 2020+

The consumer equipment are very expensive as well as infrastructure cost is expensive, and it is at a testing stage and when economies of scale is achieved it will come down in pricing as every product does.

5G was created years ago, and it has been talked up ever since, yet it is estimated that even by 2025 that the network will still lag behind both 4G (53%) and 3G (29%) in terms of Global mobile connections at a mere 14%.

It may not happen overnight but 5G is coming and tapping at your door step.

Concerns

General trend is always the infrastructural upgrading will be undertaken for urban

areas for 5G and most of the tools will only be accessible only in urban areas for countries like us and gradually move towards the rural areas.

There will be solar flares in the future, most of the satellite systems and networks will have to look out for alternative contingency measures.

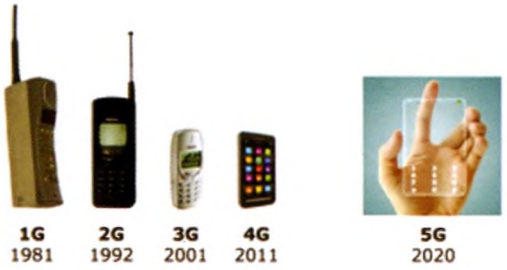
By usage of mobile towers and mobile phones already there is a lot of micro wave which is affecting the health, and with the band width increase and the small cell towers increasing the more focused waves at high concentrated speed within a small time interval, which is a high concern.

How the Broader Picture Looks like in the future to come…

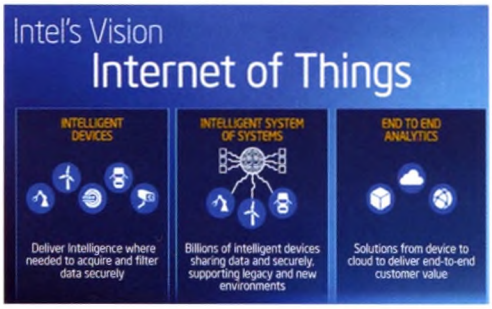
Change is inevitable, rather than embracing the change, Be the change and be the Bench Mark for the Society with your Creative Talent.

Learn to change and Change to learn

If needed and space exist can use any of the below images taken from the internet.



Technology	1G	2G/2.5G	3G	4G	5G
Deployment	1970/1984	1980/1999	1990/2002	2000/2010	2014/2015
Bandwidth	2kbps	14-64kbps	2mbps	200mbps	>1gbps
Technology	Analog cellular	Digital cellular	Broadbandwidth/ cdma/ip technology	Unified ip & seamless combo of LAN/WAN/WLAN/PAN	4G+WWWW
Service	Mobile telephony	Digital voice,short messaging	Integrated high quality audio, video & data	Dynamic information access, variable devices	
Multiplexing	FDMA	TDMA/CDMA	CDMA	CDMA	CDMA
Switching	Circuit	Circuit circuit for access network&air interface	Packet except for air interface	All packet	All packet
Core network	PSTN	PSTN	Packet network	Internet	Internet
Handoff	Horizontal	Horizontal	Horizontal	Horizontal& Vertical	Horizontal& Vertical



MODERNIZATION OF TRANSPORTATION AND INFRASTRUCTURE DEVELOPMENT

(Has Sri Lanka progressed or regressed?)

By **Upali Gamakumara**
Forum member of OPA &
Vice President of Institute of Quality and Productivity Management

Advanced transportation systems and delightful infrastructure developments are the key amenities of a developed economy (country). The two amenities are analogous to that of two water columns of a U-tube, which are fluctuating together. The height of the water column resembles the degree of development of a country. The higher the length of the water column, the more advanced is the degree of development. Truth of this assertion can be witnessed comparing these amenities of an underdeveloped country with a developed country.

Sri Lanka seems to be in doldrums after 1950's and has continually regressed. After three decades from then, by 80's, we had lost many things that were available in 50's. Tramcars, trolleybuses and double deckers available for public transport services, comfortable taxies (Morris Minor cars) available for short distance private transportation are no more in operation. Railway with clean and safe passenger cars ensured comfortable long distance public transportation. Omnibus system operated all over the country, owned by companies but under the supervision of government, ensured safe, comfortable and economically fair service to the public. All these luxuries have vanished into thin air, instead of modernization and sophistication. They have been ruined or let be ruined by authorities; first turning the system into dilapidated CTB bus service and then to the most unruly individually owned private bus service. Comfortable and safe taxi service turned into yet another unruly killer three-wheeler service.

With regard to the city's infrastructure, we were stagnated in their development without expanding their scopes or modernization. For example, government owned telecommunication system had only about seventy five thousand land lines for the whole country, by 1980, sans auto switching. We had a clearly designed city, separating business centers from residential areas, schools, playgrounds, parks and golf-courts. The beautiful canopies of huge mara trees (Rain tree) made beautiful designs of shadows on the asphalt roads protecting the commuters from tropical sunlight. So was the environmental protection. The orderliness, cleanliness and attractive natural environment made the city so attractive that the Prime Minister of Singapore Dr. Lee

Kuan Yew was enchanted by, and determined to develop Singapore to the level of Colombo.

One who experienced those beauties of Colombo, can see how badly we have 'regressed' when he sees a modernized transport and infrastructure developments in a developed city or a country. I wish to share some of my experiences in this regard.

My first overseas visit was to Hong Kong (HK) about four decades ago, in 1980. I would have been a 'Godaya' in HK, had I have never seen the city of Colombo when it was shining with all those elegances as a school boy from a village. By 1980, Hong Kong was a highly advanced city in many aspects of infrastructure developments, transportation and IT. They had the so called Mass Transit Railway (MTR) which was a unified Train, Bus and Boat service. The 'Journey planner', electronic 'you are here' service inside the carriages, electronic ticketing and auto ticket validation system of MTR service made the system easy and comfortable to its users. Those facilities were so user-friendly that any person with average IQ could learn simply by following the 'tacit instructions' given in the journey planner or through observation of other users.

MTR service

The Journey planer is a simplified topologically transformed railway line map of the MTR Service. Railway is the key mode of transport and omnibus operates as a feeder service. This map is freely available to any person so that the person can easily plan his journey using this map. In the map, different railway lines are marked in different colors. Once a person entered the railway station, he can select the best combination of lines to go to his destination, changing at appropriate interchange(s).

There are automated machines to issues tickets. Once fed a currency note into it, it issues the ticket with the balance. To enter the platform one has to feed a valid ticket into another machine to open the gate. Several electronic ticketing machines have been installed at railway stations to avoid long queues. The system is so quick that it can serve hundreds of commuters within a few minutes without any interaction with railway officers. These may not be amazing things to a young person who has visited oversees, but imagine a person from Colombo seeing these things 40 years ago or someone who has never been to a developed city.

I wish to quote the following note extracted from Wikipedia on the effectiveness and efficiency of the Hong Kong MTR service.

Under the government's rail-led transport policy, the MTR system is a common mode of public transport in Hong Kong, with over five million trips made in an average

weekday. It consistently achieves a 99.9% on-time rate on its train journeys. As of 2014, the MTR has a 48.1% market share of the franchised public transport market, making it the most popular transport option in Hong Kong.

I have had visited several other developed cities including London, when I made my second visit to HK in 2005. In those cities I could not see distinct differences to that of HK other than a few changes to suite their local requirements and the culture. On my way to HK on my 2nd visit, the mini TV screen in the airplane displayed an advertisement of something named 'Octopus'. I was not bothered to follow it carefully until my friend who was waiting for my arrival at HK airport offered me a card called octopus upon our meeting at the airport.

Puzzled by the advertisement and the card offered, I asked my friend about this mysterious octopus. According to him, you can do any monetary transaction faster than with a credit or debit card, free from hassles of feeding the card into a machine and waiting to verify credit balance, authentication etc. To make a payment with an Octopus card, it takes only a fraction of a second, without even taking the card out from a purse or ladies handbag. It is a matter of touching the octopus device at the cashier, with the purse or handbag and the money is transferred with a click. The octopus devises are kept at the MTR, near to the seat of bus driver or any such place where a customer need to make a payment. He displayed how octopus works, by touching his purse on the device in the bus and asked me to follow him.

The writer's area of professional expertise is not either in transportation or IT. Yet the intention of this piece is to show the importance of such systems to the general public and show how we have regressed from good to worst in our development. Further, it is to focus the attention of government authorities who must have experienced these things on their foreign trips at the expense of public funds to train them to serve the nation.

Finally, I wish to add a comment on the Octopus service. The name given to this system, the Octopus, has a metaphoric meaning too. That is, it operates like an octopus 'grabbing' the whole market from all sides with its eight tentacles. In Sri Lanka, we too have many octopuses who have already grabbed and control the whole market under the auspices of political leaders, taking selfishness to the extreme.

A CENTURY OF DENTAL CARE IN SRI LANKA (CEYLON)

Dr. Hilary Cooray
BDS (Cey), MSc (Lond), MFGDP. RCS(UK),FICCDE (Ortho) Singapore
General Dental Practitioner

Dentistry in the western (British) system of medicine which exists now has reached a landmark occasion this year. The first dentist was formally registered under the British Dental Registration Ordinance in 1915. The dental register is presently maintained by the Sri Lanka Medical Council. The first dentist to be registered in the dentist register which was then kept and maintained by the Ceylon Medical College Council was Sperling Christolfesz who had the British qualification LRCP, MRCS and LDS (Edin)

There were two principal ways in which a dentist in Ceylon (later Sri Lanka) could get his name registered in the dental register -, by way of qualification obtained in the United Kingdom or by undergoing an apprenticeship with a registered dentist followed by an examination conducted by the Ceylon Medical Council.

The regulation of the Dental Profession had two other aims. The first was to enable the public to identify legitimately qualified practitioners and the nature of their qualifications. The second was to detect the significant numbers of quacks from debasing the dental profession.
There was no legal definition of a dental practitioner.Educational standard varied widely and qualification were not universally accepted.

Prior to this, Dentistry was practiced in the Ayurvedic System among the Ceylonese. The British Doctors who moved with the British troops in 1815 were practicing dentistry under the Western System amongst the British population. Professionals who came here to Ceylon in search of greener pastures for trading as well as professional services like Medicine, Accounting, Legal, Civil Services and Agriculture started to practice in this island. The practice of Dentistry by the British Doctors was restricted mainly to the extraction of teeth.

Dentistry in the Ayurvedic System of Medicine

General Dental Practice as the earliest Discipline of Dentistry
Sri Lanka was known to be a prosperous colony and many British Nationals came searching for better prospects in terms of work and investment in plantations. Land was distributed for British Citizens at very nominal rates for opening up coffee plantations

It was in this era that the professionals like doctors, Dentists, Accountants lawyers and Civil Servants came here looking for comfortable lifestyles.Sperling Christolffez

established himself in a lucrative private practice in a prestigious Hotel(Bristol Hotel) in the heart of Colombo.Fort. Two other Dentists trained and with Medical and Dental qualifications from the United Kingdom namely J.S.R.Goonawardena and Eric Swan were registered in 1915. They too commenced their own private practices in Colombo and Kandy respectively. The first dentist to be registered without Medical Qualifications was Sydney William Garne L.D.S.(Eng) He joined in the partnership with Sperling Christolffelz at the Bristol Hotel.Since there was no other way of practice of Dentistry many other dentists who arrived here from the United Kingdom, some from Germany, and Singapore established themselves in General Dental Practice in Colombo , Kandy and Galle.

The Government Dental Clinic at Ward Place

In 1925 the first government dental clinic was established in the Colombo Hospital. Dr.W. Balendra LMS (Cey) MRCS (Eng) LRCP (Lond) LDS (Eng) was appointed as the first dental surgeon in charge of this clinic. He trained three apothecaries to do extractions and scaling. They were registered as dentists under Act 26 of 1927 (Dentists Register). The clinic continued for nearly ten years with their assistance. They were officially employed by the Department of Health at the same salary as qualified Dental Surgeons (Saunders Report 1954). Apothecaries had been trained and certified at the medical school following a two year training program since 1899. They played a very useful role in the health care of the people in rural areas. Later they were designated as assistant medical practitioners. Due to the absence of a training program for Dentists, Dr Balendra had no option but to train apothecaries in some aspects of dentistry and employ them in the clinic to do the work of dentists. They were employed at the Dental Institute until 1948.

Formation of the Ceylon Dental Association

By 1932, there were nearly 25 registered Dentists practicing in Ceylon at government hospitals and in the private sector.

An association is born when there is a need for it by that particular group and the public who are served by this group, and it is the availability of good leadership that will decide whether this association will survive.

On 6th December 1932, a group of 12 dentists working in the private and public sector met at the Dental Institute and formed the 'Ceylon Dental Association'. It was decided that this association be conducted as nearly as possible on the lines of the British Dental Association (B.D.A)

It was thought expedient therefore to adopt the BDA's Rules and Regulations temporarily until the Ceylon Dental Association (C.D.A) was able to modify and adapt them to local conditions. Consequently it will be seen in the Rules & Regulations therein published that the Memorandum, Articles, bylaws etc of the BDA are taken over almost entirely, except where suitable modifications had to be made to meet local requirements .

Founder Member of the Ceylon Dental Association 06th December 1932

Dr. Aneyesundara, Dr. V. Sommetamby, Dr. C. A. R. Goonewardene, Dr. A. E. Vaviot, Dr. M. Brito-Mutunayagam, Dr. W. Balendra, Dr. J. S. R. Goonewardene, Dr. A. A. Gomes, Dr. S. W. Garne, Dr. H. E. Swan, Dr. H. S. Christoffeisz, Dr. S. L. Cramer

All twelve founder members of the CDA had British qualifications. The constitution provided a strong foundation on which this association grew steadily.

The CDA brought about far reaching changes to the profession in many areas. On the resolution made by the association in 1933, the Dental Registration Ordinance was amended to ensure the title "Dental Surgeon" could be used only by those having a qualification from a University. In 1938, the association again made representations together with Ceylon Branch of the British Medical Association (BMA) to the government, when the dentists from some European countries started to register and work in Sri Lanka.

The Dental Ordinance was amended, by amendment No 55 of 1938 which prevented foreigners from practicing in the island. Medical colleagues pointed out that those nationals from other countries which did not recognize the qualifications from Ceylon, should not be registered. The Amendment states " No alien shall be registered except with the approval of the Governor on the recommendation of the Executive Committee of Health" In this section, "alien" had the same meaning as the Aliens Registration Ordinance No 30 of 1935

CEYLON MEDICAL COLLEGE

Prospectus

of the

Ceylon Dental Hospital and School

Ceylon Dental Hospital and School

On the initiative of Dr. Annesly Gomes , in 1933 the Ceylon Dental Association proposed to the government , the establishment of a Dental School. In February 1938 the first Dental School in Sri Lanka was started as the Ceylon Dental Hospital and School under the Auspices of Ceylon Medical College. It opened at the Government Dental Clinic where facilities

for clinical training and dental hospital practice were available. The first principal of the School was the Director of Medical and Sanitary Service Dr. S.T. Gunasekara L.M.S (Cey) M.R.C.P,(Lond), D.T.M. & H (Lond). The Dental School commenced with six medical graduates who were to follow a two years training with a view to granting them a licence to practice dental surgery. The first batch consisted of Dr. F.A.L.Fernando, Dr. S. S. P De Jong De silva, , Dr.John E. S. Kitto , Dr. M. Cruz Rodrigo, Dr. C. L. Batholomeusz and Dr. G. P. D. Rajarooriya. It was intended to develop a course to provide a full dental curriculum for students not having a medical qualification.

The 1938 prospectus of the Scholl states : "The present syllabus is therefore intended solely for medical post graduates and is arranged essentially in the lines of recognised British Dental School and in conforming with the requirements of the Dental Board of the United Kingdom" Dr. S. L. Cramer , L. M.S. (Cey), L. R. C.P & s (Edin), L. R.F.P. & S (Glas), L. D. S. (Edin) was appointed as Registrar.

The principal and the entire staff of the first Dental School had qualifications obtained in the United Kingdom. The first batch of six medical graduates completed the course in 1940. Three of them , namely Dr. F. A. L. Fernando , Dr. S. S. P De Jong De Silva and Dr. John G. S. Kitto . joined the government services and were appointed to the dental clinics at Batticaloa , Jaffna and Kurunegala respectively The other three, namely Dr. M. Cruz Rodrigo, Dr. C. L. Bartholomeusz and Dr. E. P. D. Rajasooriya, established themselves in General Dental practices in Colombo. The practice of Dr. Rodrigo was continued by his daughter Philomena.

The second government dental clinic was started at Galle Hospital in 1937 with Dr. A. F. Davit L. M. S. (Cey) , L. D. S. (Eden) as its first dental surgeon (Administrative Report 1938). This was followed by the opening of a dental clinic at Kandy hospital with Dr . Sam Goonawardena L. M. S (Cey) , L. D. S. ((Manchester) appointed as the dental surgeon in charge.

By 1940 there were forty one dentists registered in the Dentists Register included were , two dentists from Germany namely Rudolf Weiner D. M. D, (Munich) Paul Albesheim D. M. D. (Munich), Shinya Shinzo a Japanese dentist with a certificate from the Dental Board of Singapore and six qualified from Ceylon Dental Hospital and School. In addition four people who had passed the Ceylon Medical Council examination conducted for those who had completed an apprenticeship in dentistry. The others had qualified in the United Kingdom.

The training programme which was started as a postgraduate course for medical graduates was abandoned after the first course. The Ceylon Dental Association protested against the closure and appealed to the Governor, Sir Andrew Caldecot to establish a proper dental School (Minutes book of Ceylon Dental Association 1940)

The Dental School of Faculty of Medicine, University of Ceylon

Training schemes for dental surgeons with a full dental curriculum following the University entrance examination was by now well established in the United Kingdom. The Ceylon Dental Association and the Health Department realized the need for an independent undergraduate dental curriculum leading to a Licentiate and Bachelors degree in dentistry, as was

established in the United Kingdom. Reforms in the tertiary education system itself were taking pace in the early forties, In 1942 Ceylon University College (established in 1921) was amalgamated with the Ceylon Medical College (established in 1870) to from the University of Ceylon . There were faculties for various academic and professional disciplines. Dr. (later Sir) Ivor Jennings was appointed the first vice Chancellor of the University of Ceylon.

In 1943 a Dental School was started as part of the Faculty of Medicine of the University of Ceylon . The Dental Students Handbook 1943 states: "The University hopes to offer as from 1st October 1943 a full course of study leading to the degree of Bachelor of Dental Surgery or the Diploma, Licentiate in Dental Surgery. In both cases the course will be one of four years after the first examination in Dental Surgery, but a higher standard will be expected throughout the course from candidates for the degree". The Vice Chancellor, Dr. Ivor Jennings, appointed a Board of Studies in Dental Surgery to organize the course of studies , examination , lectures, practical classes and hospital practice; and to procure the necessary equipment.

The members of this board were Dr. W. Belinda and Dr. A. A. Gomes, Dr. Sam Goonewardena. Five students were enrolled in 1943. (Tillakaratne 1992). In the first year, anatomy and physiology were taught by lecturers of the Faculty of Medicine Dental Metallurgy lectures were given by the staff of the Department of Chemistry of the Faculty of Science.

Dr. M. A. Brito Muthunayagam and Dr. G. P.D Raja Sooriya , both General Dental Practitioners, taught prosthetic and Mechanics and the 3rd year subjects, General pathology, Bacteriology, General pharmacology, General Medicine by the staff of the Medical Faculty.

The first batch of dental graduates qualified from the new Dental School in October 1947. They were appointed as temporary acting dental surgeons on a daily

The first batch of dental graduates qualified from the new Dental School in October 1947. They were appointed as temporary acting dental surgeons on a daily paid rate of Rupees Eleven and twenty-five cents. Later, they were appointed on a permanent basis as Grade II Dental officers.

The government arbitrarily decided on a salary scale for the dental officers which brought about discontentment from the start. In the absence of a separate association to look after the interests of the government employed Dental Surgeons, the Ceylon Dental Association first made representations to the Ministry oh Health in May 1947. It sought a similar salary scale for Dental and Medical Officers.On 1st October 1949 , the C. D. A. submitted a memorandum regarding salaries of Dental Surgeons as there was much discontentment in the Dental Service because of the disparity in salaries paid to them and the Medical

Formation of Government Dental Surgeons Association (GDSA)

By 1951 there were approximately 30 Dental officers who had graduated from local Dental School and others from U.K. employed by the Department of Health. They were faced with many problems including anomalies in salaries; disparities in service issue of medical certificates. Railway warrants and many others.

On the 4th of October 1951 a meeting was called at the Dental Institute for the formation of a trade union. At this meeting , Mr .Dickson Silva was elected as the first president and Mr. V. Cumaraswamy as the secretary. Since then up to now , the trade union has been continuously demanding improvements to conditions of employment by negotiation and at times by trade union action, to bring the services to the present day levels.

The Sri Lanka Dental Association was formed in 1932 which provides leadership in professional matters. Until the GDSA was formed, all negotiations with the government on all matters of Dental Surgeons employed in the Department of Health were done by them.

Establishment of the Dental Nurses Training School

The Dental Nurses Training School was established in 1951 , with the assistance of the government of New Zealand in order to train Dental Nurses who were to treat the Children's needs in dental care. The Medical ordinance was amended to enable Dental Nurses (later designated as therapists) to attend on children who were under the age of twelve years. This clause reads as follows. "The performance by a qualified Dental nurse in the employment of the government of Ceylon of minor dental work in any public dental service School be done under the superision of a Dental or Medical practitioner,"414 School Dental clinics are managed dental therapists who perform a yeoman service to the children of this country by treating aproximately 503305 of them every year.

Formation of the Independent Dental Surgeons Association.

In 1971, Kalasuri Dr Ranjan Abeyasinghe,a Senior General Dental Practitioner at the time ,convened a meeting for the formation of an Association for Independent Dental Surgeons in private practice.It was formed with 28 members.

In 1982 when there was a need for the General Dental Practitioners to obtain higher qualifications in the discipline of General Dental Practice Dr Abeysinghe again called a meeting of General Dental Practitioners and the College of General Dental Practitioners was formed.The Founder members were those who had Post graduate Dental Qualifications or those with 10 years of General Dental Practice Experience.Since then it has been collaborating with the Post Graduate Institute of Medicine of the University of Colombo to award the Diploma in General Dental Practice Examination. The College has since then taken the task of providing Post Graduate and Continuing Dental Education to the General Dental Practitioners.

Period of Rapid Development

With the dedication, efforts, and the hard work of the members of the S. L. D. A.it had managed to purchase its own office in 1982 at the Organization of the professional Association Building. This has enabled the S. L. D. A to have a fully fledged functional office with permanent staff.

Many activates were originated. Amongst them were the Annual Scientific Sessions. The S. L. D. A orations and regular continuing professional Development programs. The branches of the association

were established in Kandy, Galle, North Western, North Central and North province. Regular out-reach programs were carried out at various parts of the country. A research fund was also established and the funds were dispersed to the research projects of the members. "Treatment of Fluorosis" project was established in conjunction with the Japanese Dental Association. "Live, Laugh & Learn" project to impart oral health education to the children and trainers were being done with the FDI Unilever collaboration.

Looking into the future will be very important for an active association like the S. L. D. A to know its future. It has its own vision & mission statements.

VISION- To be the recognized leader in promoting excellent oral health care.

MISSION- Committed to maintaining the honour and interest of the dental profession whilst keeping the excellence in oral health care nationally by public education and interaction with other health care stake-holders.

One of the important tasks in the present day scenario is to develop a good leadership amongst the profession. The association also needs to initiate action in community service by educating the public, providing access to dental care and ensuring an equitable distribution also has the responsibility of promoting as well as maintaining professional ethics and a good set of values for its membership.

The General Dental Practitioners association representing the private sector dentists, the Government Dental Surgeons Association looking after the interests of the Dentists in the public sector, Sri Lanka Dental Association and the Faculty of Dental Science is charged with the proper training of future dentists are the custodians of the well being and further development of the Dental Profession for the next few decades.

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THE GREEN SUPPLY CHAIN : TRUE SUSTAINABILITY OR JUST ONE MARKETING STUNT?

By Wing Commander (retd)
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Introduction

The supply chain encompasses all of those activities associated with moving goods from the raw-materials stage through to the end user, advocates for business process realized that significant productivity increases could only come from managing relationships, information, and material flow across enterprise borders. In other words SCM is the management that integrate physical flow of goods and related information, from procurement to final consumption, enhancing customer, and economic value.

Environmental management has become a topic of mutual concern for businesses, Governments and consumers due to increasing high levels of industrialization the growing concern in the global market for "green" issues and the scarcity of natural resources have forced executives to view supply chain strategies from an environmental perspective. High environmental risk industries, including chemical, plastic, automotive, and heavy engineering, have always considered improvements in environmental performance as one of the basic competitive priorities, alongside lower costs, manufacturing lead-time, and quality. For instance, the countries passed the Restriction of Hazardous Substance and the Waste Electrical and Electronic Equipment regulations demanding compliance with the relevant regulatory laws of product recycling and prohibiting the use of hazardous substances in products for sale in the market. In this development, the supply chain manager plays an important role of selecting and developing appropriate green strategies with the objective of improving environmental, economic, and social performance as well as gaining a competitive advantage.

Background on Green

The term "green" is now widely used interchangeably on the more established "sustainability" concept, which points to a more holistic view of environmental, social and economic impact. Green supply chain management (GSCM) is an emerging field motivated by the need for environmental consciousness. Standing out of the conventional supply chain view, GSCM was sparked by the "quality revolution" in the 1980s and the supply chain revolution in the 1990s. Over the years, GSCM has attracted the attention of academics and practitioners, focusing on reducing waste and preserving the quality of product-life and natural resources. Eco-efficiency, which seeks to minimize ecological damage while maximizing production efficiency, and remanufacturing, have become key assets to achieve best practices. Customer

demands and governmental pressures continue to push businesses to be more and more sustainable. Consequently, governmental legislations and public mandates for environmental accountability have brought up these issues on the drawing board of many strategic planners, bringing several green concepts into place.

Following the green or ecological pressures from customers, stakeholders, and governments, a number of operational guidelines, standards and legislative frameworks have been put in place to minimize environmental impact. Motivated by the need for companies to move towards ecologically sustainable business practices, the ISO14000 series standard was designed with the following objectives;

a. Encouraging an internationally common approach to environmental management;

b. Strengthening companies' abilities to measure and improve environmental performance, through continual system audits, and improving international trade and removing trade barriers.

In light of the above issues, it can be seen that GSCM is driven by the increased environmental deterioration such as depletion of raw materials, overflowing waste landfills, and pollution in general. Thus, GSCM primarily seeks to minimise the wastes within the industrial system, to prevent the dissipation of harmful materials into the environment, and to conserve energy resources. The objective, however, is not only about environmental friendliness, but also a good sense of business and higher profits. Business organisations have realised the need to upgrade their supply chain management from a purely functional role to a strategic role to comply with current environmental legislations and maintain an enduring competitive advantage, through technological innovation and improved eco-efficiency. Operations managers in earlier environmental management systems were involved only at arm's length where individual organizational units managed environmental performance in product and process design, logistics, marketing, compliance regulations, and waste management. Though it has long been realised that green strategies should meet the required order winning criteria in the market place, the idea needs to be extended to the entire supply chain. Best practices call for collaborative integration of environmental and operational performance. There is a growing need for integrating environmentally sound choices into supply chain management practice and research.

Objectives

In view of the above issues, supply chain management has recently shifted its roles to refocus the supply chain in the following areas;

a. Natural environment.

b. Environmental performance.

c. Enhancing supply chain collaboration.

This paradigm shift has been influenced by local and international legislative changes, market pressure, and the increased use of environmental requirements from customers in the supply chain. This has

generally encouraged fast acceptance of green principles world-wide. Currently, there is 'a substantial need for improvement on the best way to select the most appropriate green strategy in a particular industry context. Very few researchers have considered the issue of identifying taxonomies for conventional supply chain management. The taxonomy can provide the basis for developing theories. In addition, taxonomy also provides parsimonious categorical types without losing the main information or characteristics that exist within the type, and has been applied in strategic management and logistics studies.

GSCM focus

Four main areas of focus are environmental performance standards, eco-efficiency, green technology innovations, and collaborative supply chain with remanufacturing and recycling practices.

One important observation from these empirical activities is their remarkable focus on operations that influence environmental performance, as opposed to conventional supply chains which focus on customer satisfaction, service quality, responsiveness, and the supply chain cost. The central goals of the green supply chain are primarily centred on those process operations that influence environmental performance. Thus, the end goals of GSCM are categorised as follows:

a. Waste (of all types): minimization of waste;
b. Energy usage: minimize energy consumption; and
c. Resource usage or material consumption: optimize resource usage.

The success of GSCM goals, that is, waste reduction, minimal energy usage and optimal resource consumption, are strongly dependent on the green operations or processes chosen. On the one hand, processes can be eco-efficient by focusing on operations-based efficient targets which provide secondary environmental benefits. On the other hand, processes can be more environmentally specific, with more product-life cycle considerations. Such processes tend to be more focused on green efficiency. It is important to note that the green process operations are directly related to the inherent product characteristics.

GSCM goals are influenced by the green product (process) chosen; a green product (or process) can either be innovative or functional, while a process operation can be cantered on eco-efficiency or green efficiency.

One other important observation in this is that the above empirical activities show that green supply chains tend to improve their performance by developing specific green capabilities and by building collaborative supply chain relationships. The supply chain improvement towards the green practices is enhanced through competitive pressure from the market or customers, regulatory certification schemes, incentives, and direct involvement. Supply chain relationships are often developed based on two different climates, namely, coercive climate, where contractual clauses are enforced between suppliers and

customers and collaborative climate, which calls for increased mutual involvement for customers and suppliers. These climates act as determinants of the success of green strategies chosen. Because the coercive approach demands a prescribed minimal level of compliance to standards, it lacks capacity to encourage advanced performance management. On the other hand, collaboration encourages new knowledge, technologies and innovation. However, a higher level of inter-organisation involvement and collaboration is required, if green supply chain goals are to be achieved. In this regard, we draw on the influence of supply chain collaboration on the success of GSCM strategies to define a framework for selecting appropriate green strategies. But how does the nature of process or product influence the success of the green supply chain? GSCM goals are enhanced by two types of green supply chain relationships, that is, coercive or collaborative relationships. A common question arises as to what might be the most appropriate green supply chain strategy given a specific context, with a particular product, a specific process, and/or a particular supply chain relationship. What are the underlying GSCM dimensions upon which the right choice of green strategies can be made? In this, we draw on the critical issues of supply chain relationship, product and process types to establish a taxonomic methodology for the selection of appropriate green supply chain strategies. The next section identifies the relevant dimensions of GSCM strategies together with their specific gradations.

Dimensions of Green

The relationship is a crucial dimension that must be taken into consideration when developing a taxonomic framework for the selection of appropriate green strategies. Findings in this study also identified product and process technology characteristics as key dimensions that influence the choice of green strategies. We suggest a three dimensional taxonomic scheme that is more appropriate for delineating GSCM strategies. The dimensions and their gradations are as follows:

a. Relationship (supply chain relationship) - is either coercive or collaborative;

b. Process - focuses on either eco-efficiency or green efficiency;

c. Product - is either functional or innovative.

A coercive supply chain relationship is characterised by enforced contractual clauses between suppliers and customers. This approach demands a minimal level of compliance to standards, with very low information sharing. Suppliers seek to meet predictable demand at the lowest possible costs. On the contrary, a collaborative supply chain calls for enhanced mutual involvement between customers and suppliers. In addition, supply chains tend to respond quickly to unpredictable demand due to their high agility and flexibility. Product life cycle costs and overall supply chain costs are the main objectives of the collaborative supply chain. This approach is conducive to innovation and dynamic technology evolution. In light of these issues, we provide a summary of our views on the

characteristics of coercive and collaborative supply chain relationships.

Although characterising products as functional or innovative may be an oversimplification, it is a practical high-level classification. In our view, functional products tend to satisfy basic needs, which do not change much over time, e.g., staples. Consequently, such products have stable, predictable demand and long life cycles. It follows that their processes do not change much over time, and they focus on eco-efficiency through optimal resource usage and low waste in order to maximize economic performance. On the other hand, innovative products tend to satisfy fast-changing needs. As such, innovative products have unpredictable demand and short life cycles, e.g., hand phones. What makes a product innovative is the drive towards green efficiency through the application of specialised processes with the aim of keeping up-to-date with emerging environmental legislation. Hence, innovative products and green efficiency are highly related.

Strategies for GSCM

Risk-Based Strategies, the simplest strategy of GSCM with regard to inter organizational investment resource development is one of the risk minimization. Firms adopting this strategy are proposed to do so in response ostensibly to stakeholder requirements. Such a strategy is ideal for the organization that retains minimal internal environmental management resources or has only recently begun to consider the introduction of a supply chain greening program.

Efficiency-Based Strategies, a more complex and developing strategy in recent years has been the 'eco-efficiency' or 'lean-and-green' approach to GSCM. This type of strategy derives environmental performance benefit for the supply chain beyond mere regulatory compliance through the requirement for suppliers to meet operations-based efficiency targets.

Close Loop Strategies, the whole supply chain includes the reverse flow of products and materials for the purpose of material replacement, waste treatment, re-processing, remanufacturing, repairing and/or recycling. The complete logistics system must include two parts: Forward Logistics and Reverse Logistics. However, in the present scenario, managers are focused only forward logistics being ignorant towards reverse logistics. There are two types of reverse logistics 'asset recovery' and 'green reverse logistics' The challenges faced by India in reverse logistics are: meeting customer expectations, managing expenses, Infrastructure, unorganized retails, complicated rules and regulation

Compliance-based strategies, include establishment of international standard systems such as ISO 14001, use of performance standards, inclusion of purchasing contracts for suppliers to meet certain regulatory requirements. Similar to basic certification systems is the use of broad statements with purchasing principles or guidelines for suppliers. Most organisations such as Wal-Mart and Seventh Generation introduced procurement requirements for compliant purchasing. The advantages offered by compliance-centred strategies are as follows:

a. Environmental performance benefits;

b. Use of globally recognised systems, and;

c. Third party management of performance.

These aspects in turn, improve recognition and acceptance not only by suppliers, but also by the market and stakeholders. Any ambiguity in regards to the desired performance is reduced significantly. The disadvantage of these strategies is that, because if their reactive approach, they offer limited competitive edge due to their lack of innovativeness, a lack of uniqueness, and ease of application by competing supply chains. Since these systems are managed in a low collaboration climate, they only guarantee compliance with regulatory requirements. As a result, additional benefits from innovation or economic efficiency are very unlikely.

Lean strategies, are a more recent group of green strategies whose focus is on eco-efficiency in which suppliers are required to satisfy certain operations-based efficiency targets. In addition, secondary environmental performance benefits may be obtained from some operations practices that provide green performance advantages. These strategies are ideal when the supply chain relationship is more collaborative and the process/product is still functional. A high level of inter-organisational collaboration, arising from the use of integrative inter-firm performance requirements, is necessary for situations with complex problems associated with waste reduction and recycling. The lean-based strategies link environmental performance with operational efficiency within the supply chain, allowing for the extension of performance requirements into the supply chain that maximises economic performance while enhancing environmental performance through waste reduction and optimized (minimal) resource usage. Wal-Mart introduced green strategies aimed at creating zero waste and selling of products that sustain Wal-Mart's resources and the environment.

The advantages of lean-based strategies are: (i) they offer eco-efficiency to the entire supply chain and (ii) they readily lend themselves to existing organisation goals of optimisation and cost reduction. On the other hand, lean-based strategies do not give room for advanced environmental management initiatives such as green product design, innovation and material substitution. In so doing, the lean strategy is considered as technically weak.

Impact of green strategies on operations policies

The above study highlighted the fact that specific green strategies affect various aspects of supply chain operations, including the purchase of materials and energy, new process technologies, process control involving disposal operations as well as water and air pollution and the output of green and clean products. In retrospect, each strategy has specific impacts on purchasing, product technology, process technology, and logistics and transportation activities, as well as performance measurement systems. We outline the impact of these green strategies in the following sections.

Since the strategy calls for compliance with stakeholders' requirements, organisations

tend to react to changes to regulatory requirements. As a result, purchasing policies should be focus on avoiding the use of hazardous materials through development of appropriate material selection criteria. Often, ad hoc solutions are introduced on production processes in a bid to adapt to new environmental requirements, which may be costly in the long term. Not many changes are expected in logistics and transport operations. Basic environmental performance standards such as ISO14000 and OHSAS18000 series standards are adequate for this strategy.

Significant changes are highly expected regarding operations policies as the supply chain players seek to gain a competitive advantage. Procurement policies are supposed to be changed through collaborative relationships. Supply chain value partners have to collaborate in establishing research and development (R&D) projects that carry out product life-cycle analysis aimed at introducing new product and process technology innovations to contribute to the overall value creation. As far as production processes are concerned, organisations do not only seek to gain green efficiency from an ecological perspective, but also to take advantage of the green strategy to gain a competitive position. New green products that can be remanufactured or recycled are expected. As a result, management should pay attention to developing relationships between supply chain operations. As far as logistics is concerned, recycling and product take back initiatives are a priority. Therefore, logistics operations should be redesigned to suit such integrative relationships between players.

Conclusions

Green Supply Chain management is the field that incorporates majorly environmental and sustainable issues starting from the procurement till the customers' shelf. Apparently in the present scenario the green supply chain practices focus on cost reduction and pollution prevention, due to which we are observing positive changes in organizations evolving and incorporating more proactive sustainable measures into their strategy and as everyday practice. However, organizations must also include the factor of corporate social responsibility into their kitty of strategies to build up credence about themselves in the view of customers, stakeholders, shareholders and employees; as the organizations are corporate citizens of the society at large.

Green Supply Chain Management
Value of a Network Approach
BOM Analysis
Tier2+
Partner Selection
Reverse Operations
Channel / Distribution
ERP
Supply
Demand
Supply
Substitutable components
Sourcing choices
Location choices
Inventory policy
Safety stocks
Lot sizes
Replenishment VMI/VMR
Packaging
Package size options
Package recycling options
Corrugated box
Processing
Transportation
Modes
Shipment frequency
Load consolidation
Carrier routing
Energy
Embodied Energy
GHG Regulatory $ Impact
e2open

Green Design
Green Suppliers
Green Purchase
Green Manufacturing
Green Packaging
Green Warehouse
Green Transport
Green Customers
GREEN SCM

BENEFITS OF GREEN SUPPLY CHAIN MANAGEMENT
Environment and Social Impact of Supply Chain Functions
Plan
Source
Produce
Store
Transport
Reverse Logistics
Benefits
Financial Benefits
• Increased Revenue
• Reduced Costs
• Increase Asset Utilization
• Enhanced Customer Service
Environmental Benefits
• Reduced Waste
• Increased Energy Efficiency
• Reduced Air Emissions
• Reduced Water Emissions
• Reduced Fuel Consumption
Social Benefits
• Reduce Community Impacts
• Noise Reduction
• Traffic Congestion Avoidance
• Health
• Safety
• Security

WORLD'S TOP 25 SUPPLY CHAINS - 2018

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Gartner is the world's leading information technology research and advisory firm providing technology related insights, founded in 1979 and head quartered in the United States. Research provided by Gartner is targeted at CIOs and senior IT leaders in industries that include government agencies, high-tech and telecom enterprises, professional services firms, and technology investors. Gartner clients include large corporations, government agencies, technology companies and the investment community. Gartner uses hype cycles and magic quadrants for visualization of its market analysis results.

Gartner ranking is done annually to rank word's top 25 supply chains. 2018 marks the 14year anniversary of the Gartner Supply Chain Top 25 ranking. This year features a diverse set of large, global companies with mature, demand-driven supply chains. There are lessons to be learnt from these supply chain leaders, many of whom have led their industries over the past decade.

This year's Gartner ranking is led by Unilever for the third successive year, followed by Inditex, Amazon, Cisco, Colgate Palm olive and Intel occupting the top 5 positions. High-tech industry dominance which has been there over the years in the rankings is slowly diminishing now with other companies taking over them in the rankings. The companies who have been in the top 5 ranking for at least 7 out of the 10 years are categorized under Masters list for their consistent performance. Longtime supply chain leader and last year's runner-up McDonald's joined Apple, P&G and Amazon in qualifying for the "Masters" category, which Gartner introduced in 2015 to recognize sustained leadership over the last 10 years.

The key to McDonald's success is skillful orchestration across a network of strategic suppliers, service providers and thousands of companies and franchise-owned stores worldwide according to Gartner. The company is also experimenting with digital supply chain capabilities like augmented reality to manage storerooms, so staff can spend more time with the customer.

Unilever has a strong supply chain brand, which is reflected by its top-tier opinion poll score. It also received a perfect 10 for corporate social responsibility (CSR). They are making big bets in the digitization of its supply chain. A key initiative is robotic process automation (RPA) supporting the order-to-cash process, run from its regional service control towers. Its more than 20 'bots' have already automated hundreds of processes, with a roadmap for hundreds more.

The Gartner Supply Chain Top 25 is about leadership. Annually Gartner identifies the companies that best demonstate leadership in applying demand-driven principles to drive business results. The ranking score is based on a combination of the peer and Gartner opinion, Return On Assets, inventory turns and 3 year revenue growth.

From the beginning, a primary objective of the Top 25 has been to foster the celebration and sharing of best practices and to raise the bar of performance for the broader supply chain community. It also seeks to shine a light on the importance of supply chain for corporate executives and the investment community at large.

The ranking is focused on identifying supply chain leadership, which includes operational and innovation excellence, but also other behaviors such as corporate social responsibility and a desire to improve the broader practice of supply chain management. While the list always changes from year to year, there are some common characteristics that separate the best from the rest.

Gartner's Top 25 Supply Chains for 2018 is given below with a comparison against the 2017 ranking in table 1.

Table 1 - Gartner Ranking 2018

2018 Rank	Company	Company Logo	2017 Rank
1	Unilever	Unilever	1
2	Inditex	INDITEX	3
3	Cisco Systems	CISCO	4
4	Colgate Palmolive	COLGATE-PALMOLIVE	9
5	Intel	intel	6
6	Nike		8
7	Nestle	Nestlé	7
8	Pepsico	PEPSICO	11
9	H&M	H&M	5

10	Starbucks		10
11	3M		12
12	Schneider Electric		17
13	Novo Nordisk		Not in the List
14	HP Inc.		19
15	L'Oréal		20
16	Diageo		23
17	Samsung Electronics		25
18	Johnson & Johnson		13
19	BASF		16
20	Walmart Inc.		18
21	Kimberly-Clark		21
22	Coca-Cola Company		14
23	Home Depot		Not in the List
24	Adidas		Not in the List
25	BMW		22

Three key trends stand out this year for supply chain leaders that are accelerating their capabilities, separating them further from the rest of the pack.

- **Focus on Customer Experience**
  Gartner defines the customer experience (CX) as the customer's perceptions and related feelings caused by the one-off and cumulative effect of interactions with a supplier's employees, channels, systems and products. Companies recognize that their customers are heavily influenced by their supply chain experience - a late delivery disappoints, an expedited delivery delights.

  Many leading supply chains are using digital connections with customers to better understand their use of products, predict future demand and more quickly respond to issues, even before they appear.

- **Scaling Digital Supply Chain Capabilities**
  After a first round of experiments, leading companies are scaling the most viable digital supply chain solutions in factories, warehouses and corporate back offices. While automation is most common in manufacturing and logistics, there has also been an explosion in digital customer service. This includes RPA in the order-to-cash cycle and the use of trained artificial intelligence (AI) customer service chatbots that customers may mistake for a human, due to their use of natural language.

- **Moving to Circular Supply Chain Designs**
  Leading companies have changed their mindset when it comes to environmental sustainability. Advanced supply chains now take a life cycle-based approach to understand the total impact of products and operations across the value chain.

  There are many reasons why companies are pursuing these 'circular economy' strategies. It is often seen an altruistic desire to do what's best for the environment and society, combined with a commercial desire for continued differentiation in competitive markets. As a result, some companies are now recycling and repurposing old parts in new products and extending the life cycle of existing equipment, as part of broader circular business strategies.

Gartner Ranking Methodology

The companies are selected for Gartner ranking using the annual Fortune Global 500 and Forbes Global 2000 rankings. Certain industries and companies are eliminated from the list since some don't have supply chains per se, or their supply chains have unique characteristics that unfairly distort the metrics used in the ranking. Some of these industries include financial services, airlines and insurance. In addition, some individual companies are eliminated because of the unavailability of up-to-date financial data.

A composite score is derived for each company on the list, made up of three components. The first component of the ranking is publicly available financial data, which is weighted at 50% of the total score. The second component is the Gartner analyst opinion, which is weighted at 25% of the total score. The Gartner analyst voting panel consists of both industry and functional supply chain analysts. The third component is a peer opinion panel, which is weighted at 25% of the total score, and comprises supply chain professionals across manufacturing and retail businesses.

These three components are combined to create a weighted average score for overall supply chain leadership. The following financial metrics are used and all financial data is taken from each company's annual report:

- Return on assets (ROA) - Net income / total assets
- Inventory turns - Cost of goods sold / inventory
- Revenue growth - Change in revenue from prior year
- CSR Component Score - Index of third-party corporate social responsibility measures of commitment, transparency and performance.

Composite Score: (Peer Opinion*25%) + (Gartner Research Opinion*25%) + (ROA*20%) + (Inventory Turns*10%) + (Revenue Growth*10%) + (CSR Component Score*10%).

A three-year weighted average for the ROA and revenue growth metrics is used. The yearly weightings used are as follows:

- 50% for the most recent year
- 30% for the second year
- 20% for the third year

For inventory, a one-year quarterly average calculation is used.

The intent of the Supply Chain Top 25 is to identify demand-driven leaders. This is defined as companies that, in the voter's expert opinion, and based on his or her knowledge of the industry and the practices of supply chain, are furthest along toward the demand-driven ideal.

The web form contains a master list of companies to consider. Each voter goes through a four-page system to get to a final selection of leaders. Average time to complete the vote is 15 minutes, and no voter should take more than 60 minutes. All the individual votes are then tallied across the entire panel, with 25 points earned for a No. 1 ranking, 24 points for a No. 2 ranking and so on.

Panellists aren't expected, nor are they encouraged, to conduct external research to place their votes. By definition, each person's expertise is deep in some areas and limited in others. The polling system is designed to accommodate differences in knowledge, relying on what author James Surowiecki calls the "wisdom of crowds" to provide the mechanism that taps into each person's core kernel of knowledge and aggregates it into a larger whole.

Definition of Excellence

Gartner defines excellence as demonstrating leadership toward a demand-driven ideal. The Demand Driven Value Network (DDVN) model (Figure 1) has seven dimensions with interrelated areas of capability and five stages of progressive maturity along each dimension. The five stages in the maturity continuum are anticipate, integrate, collaborate and orchestrate.

Figure 1 - Gartner seven dimensions of demand driven value network excellence

Reference : https://www.gartner.com

INNOVATIVE DIGITALIZATION

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- Powering infrastructure development digitally
- Modernization of transportation and development
- Towards a digitalized business era

(My effort to write under the above title and sub-titles have been based on information obtained through **Internet** and several **websites**)

According to www.businessdictionary.com, **"Digitalization"** is the integration of digital technologies into everyday life by the digitization of everything that can be digitized. **Digitization** is the process of converting information into digital format. On browsing the internet, one may find many definitions of the two key words highlighted above followed by deeper explanations

Digitalization harnesses the power of technology to solve problems, gives a new dimension to the customer experiences, accelerates change, and reinvents business models. Going digital has thus become a key differentiator for companies when competing in today's industries. The process of going digital is often considered simply the adoption of a specific technology.

Digitalized Technology is an integral part of every business as well. Availability of advanced mobile devices, the internet of things(ioT),cloud services, and demands of people within the business community are putting tremendous pressure on organization to either adapt and evolve or face serious operational risks. Although the term "digital business" has been kicking around for a while and has carried a variety of meaning it is now solidifying as a term explicitly used to describe an emergent business that will soon dominate the way transactions are carried out. Regardless of how individuals or groups have thought about digital business in the past, it's time for change.

In the **Sunday Times Magazine dated 26th August'18,** the following article titled "working towards a digital economy" which referred to a joint initiative between the Ministry of Telecommunication, Digital Infrastructure and Foreign Employment (MTDIFE) and the United Nations Development Programme (UNDP) in association with the National Youth Services Council (NYSC) and the Information Communication Technology Agency (ICTA). I am quoting the above information in order to illustrate the fact

that many such initiatives are indeed taking place in creating awareness about the developments taking place in the field of digitalization.

Another newspaper item that too in **the ST of 26th August** has a paragraph under the broad title of "How to prevent winner- takes - all democracy". It reads, "On the first question (that of escalating trade war vs debilitating currency war), one hypothesis is that new digital technologies are changing the structural incentives for corporations, political parties and other institutions. ------"

Digitalization has fundamentally changed the world as we know it. Gradual shift to digitalization may be noted in our day to day lives including new ways of communication, shopping, travel etc. The business world is changing dramatically. Customers in the business world have high expectations, higher than they have ever been. Competition is no longer localized; rather it is global. Technology in general including IT, is an integral part of every person`s daily life; they have grown exponentially. In the recent past, we have seen increased use of digital technology to maintain patient records as well the services provided by service providers in the medical sector

Economic growth is increasingly linked with transport developments including infra structure.

Transportation is an important part of the nation's economy. Over the years, It has progressed at a rapid pace, and today there is a wide variety of modes of transport by land, water and air. Public transport still remains the primary mode of transport for most of the population. Despite improvements, several aspects of transport are still riddled with problems due to outdated infrastructure and a burgeoning population, and the increasing demand for transport infrastructure and services. On the other hand, we know that advanced digitalized technology has enabled the creation of speed bullet trains and auto cars, making life that much easier as far as transportation is concerned.

No doubt, innovative digitalization has created a new generation of technology savvy population and, the changes we see as a result are mind boggling to say the least. Speedy transactions seem to be the order of the day and, whether one likes it or not, we need to keep pace with global trends in digitalization and related technology.

IS SRI LANKA ON THE DOOR STEPS OF DIGITALIZATION ?

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Digitalization process in Sri Lanka

Sri Lanka is still lagging behind digitalization when neighbor India and even Bangladesh has surpassed us. Bangladesh has introduced biometric ID's for their 110 million citizens which is a base for digitalization in other areas, when Sri Lanka is struggling to issue Id's for her 21.2 million citizens. In the United Kingdom the Nation Health service (NHS) is digitalized and centralized to give the best health care in the world, when USA is trailing behind to study the system for their citizen health regime. Line Minister in Sri Lanka appears to work hard with his available resources for the introduction of the digitalization regime to revolutionize the life of Sri Lankan citizens. It seems the Government is to spend 10 billion rupees in 64 projects on digitalization revolution with the ICTA - the engine of the state in this sphere. "Federiederch Naumann" Foundation has funded for digital transformation in Sri Lanka on research opportunities and challenges in order to leapfrog from 2G to 3G and 4G with connectivity of 960 state institutions documenting, globalizing and harmonizing the vision to be an active member of the global village integrating world digital platforms. According to experts computing is about living and not about computers any more when innovations are fast moving with sharing of information thereby digitalization has already come to our doorsteps with ripple effects of global development reached with 125% mobile owners more than the population high computer literacy and internet use of 30% of the population. Organization of Professionals in Sri Lanka has chosen "Digitalization Economy and Governance" as the theme of the 31st annual sessions in 2018 when the Consumer International has proposed "building a consumer trusted digital world" in 2017 and "making digital market places fairer" in 2018 as themes of the year showing the priority shown to digitalization process in the current fast moving world digital order.

Consumerism in the Modern/Digital Age

Marketing which is directly connected to digitalization process is fast changing in the world with modern consumerism in the computer world with revolutionary changes. Digital market platforms are fast invading the world having currently settled in the west and slowly in the so called under developed world slowly and steadily intruding slowly and steadily to the rest of the world including Asia/Sri Lanka. Today Sri Lankan public/consumers are well equipped with mobile phones, internet with the influence of the young new generation comfortable with mobiles computers and adequate knowledge. In public transport or social gatherings the consumer is confined to themselves immersed with the mobile phone with anti-social behavior when banks and public/private bodies encourage the citizen/consumer to make use of smart phones for day to day domestic, business and public duties/commitments. Face

book users and those immersed in the social media are a large percentage of the population when EBay, Ali-Baba, and other international mega platforms are known and used by the trader in Sri Lanka and the ordinary citizen is fast growing. Credit Card usage and internet money transfers are frequent and a common occurrence in supply chains and banks. Local Pick Me and foreign UBER are well known to the consumer and consumed by a fair percentage of the population. There are over 40,000 UBER taxies in UK and much more in USA Car industry is planning electric unmanned cars in few years. UBER and other car giants have targeted the deadline of 2 to 5 years for driverless auto driven cars on the road with plans to expand worldwide. It appears that Sri Lankans too will be compelled for a long jump towards modern consumer platforms and digital consumerism which is not a surprise considering the rate of computer literacy and utilization of gradual digitalization process in many areas. When 3 billion world citizens that is 30% are online Sri Lanka has 3.5 million FB users, with 115% mobile penetration and 33.4% internet accounts with indications that the days are not too far to reach the digitalization goal with the ripple effects from the open internet platform and high rate of literacy and competency on IT and Education.

Digital Market Places

Digital marketplaces are fast penetrating to the consumer worldwide. In the United Kingdom and the so called developing world 40% of purchase of consumers is online visiting the market places online and the items are either delivered or sent to collection points near the residences. Mega platforms are spreading worldwide including Sri Lanka with the advent of modern technology used by the Sri Lankan consumer via 23 million mobile phones and the internet replaced by the traditional land phones. Sri Lankan business community no longer visit Hong Kong, Singapore, China, or any other market place for traditional purchases of goods for sale physically due to the utilization of modern technology global platforms and online or bank transfers which are somewhat risky unlike in the west such frauds and happenings are rare due to regulatory powers of the State, Consumer Organizations, Media, and good business practices. Advice from the magazine "WHICH" and Government (DTI) department of trade and Industry in UK, Chambers of Commerce and consumer movement in EU, monitors, references give protection and guidance to the consumer in dealing with the trader. How safe are the consumer in the west when things go wrong due to scams, frauds, and unethical trade practices which are rare are monitored and supervised by the and regulated by the Department of Trade and Industry, Powerful Consumer Organizations, with the powerful media with well-educated consumer backed by the well-organized consumer organizations unlike in Sri Lanka where the main regulator Consumer Affairs Authority being one of the most inert and inefficient white elephants giving priority to collect fines from the small trader instead of educating the consumer, trader and the regulator for the betterment of the consumer which is the least looked after segment of the society always in the receiving end giving no attention on competition law and practices which is the media in use in the west on promoting good practices consumerism towards digitalization. Chambers of commerce in Sri Lanka are traditional organizations not modernized the services to suit the modern challenges and requirements when other parts of the world Chambers

and vibrant active and takes the trader and the state to the right direction in this competitive environment. The day is nearing faster a fair cross section of the consumer will be modernized to utilize the local and international platforms and digitalized online buying.

E-Commerce and buying products online

E-Commerce buying or products services online have transformed the marketplace to a new era with modern technology. Digitalization is embracing education, technology, commerce, business, health and many other sectors in Sri Lanka and South Asia with ripple effects of world trends. E- commerce and buying products and services online have transformed the consumer with connected devices and payment methods can buy anything from music to take away travel accommodation buying things events where these new way of trade has opened vast array of choices, requiring access, safety, consumer movement in a better digital world. Ministry of Telecommunication and Digital infra-structure is entering into an MOU with digital broad band with "Hauavi Technologies", "E Gram Pital Project", and MOU with UNDP. With the Ministry with ripple effects of the world trends digitization process is bound to reach faster than expected and the consumer is warned to be ready for the impending changes in due course.

Expansion of digitization and way forward

Digitization will not be confined to consumerism as it will be not developed and expanded on isolation. Entire infra-structure and systems will have to be changed modernized and digitalized to suit Health, Education, Administration, Economy, governance and other areas in modern life facing challenges on innovations - the Ministry has pledged to act upon. Digitalized system will be fast safe and convenient to the citizen for development and a better life, provided it is given with adequate safeguards, with organized consumer movement as in the West where the consumer is organized with the media and the organized bodies and publications such as "WHICH" magazine in UK which provides information and protection to the consumer with activism with the assistance of the consumer, trader, industrialist and the government (Department of Trade and Industry). Digitalization and e-consumer is safe in the west due to safeguards taken by the state, self-regulatory procedures and advanced trade practices coupled with good trade practices and regimes in practice unlike in Sri Lanka and less advanced consumer climates. Therefore strict regulatory powers, state intervention and imposition of good trade practices are necessary for a safe and proper digitalized regime and governance. (reading materials- Lanka Web 19.2.2018 digital market places in few years/ making fairer digital market places Lanka Web 7.3.2018/ Lanka Web 15.12.2016 consumer rights in the digital age/ How to build a consumer trusted digital world Sri Lanka Guardian 14.3.2017/ Protecting Consumers Financial Times 14.3.2014 all by Sarath Wijesinghe / Sunday Times 11.3.2018 Randima Atagala / IPS consumer rights in digital age Jayantha Fernando/ CAA Web 15.3.2017 A digital age consumer can trust)

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MAIZE PRODUCTION POTENTIAL AND IMPORT REQUIREMENT FOR SUSTAINABLE FEED SUPPLY IN SRI LANKA

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Chairman of All Island Poultry Association

1. Introduction

Maize is the most important coarse grain, for which around 67,000 ha of land is devoted in 2016 in Sri Lanka, the second highest land extent next to rice amongst non-plantation sector. Highest maize production in the country was reported in 2014 which was 240,000MT. Maize is mainly used for Animal Feed Industry; annual maize requirement for the industry is estimated to be around 400,000MT from which we import varying quantities every year to meet the deficit. In addition a quantity around 35,000MT is used for human consumption including Thriposha and other industries requirements.

Maize is mainly grown by small scale farmers who are scattered in Anuradhapura and Moneragala districts and the majority of the extent is sown in Maha season as a rain fed crop. Nevertheless, maize productivity of Sri Lanka is less, not only compared to USA, the major maize producer in the World, but also to other countries in the region. However, commercial farmers are increasingly use advanced technology (high yielding Hybrid Seeds, irrigation systems, etc.) resulting a trend of increasing the productivity. Yet, national annual maize yield varies significantly due to rain dependency of crop water requirement.

Maize is widely cultivated throughout the world, and a greater weight of maize is produced each year than any other grain. The United States produces 35% of the world's harvest; other top producing countries include; China, Brazil, Mexico, Ukraine, Indonesia, India, France and Argentina. US has produced approximately 354 million metric tons in 2015, 40% of the harvest was used for corn ethanol production. Genetically modified (GM) maize made up 86% of the maize planted in the United States in 2015 and 32% of the worldwide maize crop was GM verieties in 2015 (en.wikipedia.org/wiki/Maize). GM maize produces higher yields, US reported yield was 174.7 bushels in 2014 which equals to 10,175 kg per hectare.

2. Maize Production in Sri Lanka

a. Cropping conditions

Maize requires plenty of sunlight and well-drained soils with adequate moisture supply for uninterrupted growth and higher yields based on yield potential of the seeds sown. By establishing the crop with on-set of rainy season, maize can be cultivated under rainfed conditions. Planting for the Maha season commences in October and harvest is possible after 120 days. Those who can provide supplementary irrigation are able to get better yields. Yala cultivation is mainly depending on availability of irrigation

facilities; hence land extent cultivated is limited to only 16% of annual extent sown. The highest reported annual average yield is 3,580 kg per hectare in 2014. Officials in Agriculture Department and other players conduct out-grower programs which involves advisory services in technology dissemination leading to better productivity.

b. Production status

Increasing trend of maize productivity is evident over last 6 years as depicted below.

Table 1: Maize Production 2010 to 2015

Maize Production 2010 to 2015

Year	Season	Extent - Ha	Harvest - T	Avg. Yield T/Ha
	Maha	48,887	127,761	
	Yala	8,731	33,933	
2010	Total	57,618	161,694	2.81
	Maha	41,906	104,491	
	Yala	8,639	33,306	
2011	Total	50,545	137,797	2.73
	Maha	50,881	165,999	
	Yala	8,648	36,616	
2012	Total	59,529	202,615	3.40
	Maha	55,892	173,320	
	Yala	11,830	35,628	
2013	Total	67,722	208,948	3.09
	Maha	57,525	210,886	
	Yala	9,686	29,702	
2014	Total	67,211	240,588	3.58
	Maha	57,094	207,075	
	Yala	9,456	28,854	
2015	Total	66,550	235,929	3.55

Source - Department of Census & Statistics

Table 2: Maize Production in Key Districts 2014

District	Extent - ha
Anuradapura	22,603
Monaragala	20,092
Badulla	10,619
Ampara	3,342
Other	10,55
Total	**67,211**

c. Farmer Cost of Production (COP)

Farmer COP for rainfed cultivation, with supplementary irrigation if necessary, which follows recommended cultivation practices and use standard input cost is given below.

Table 3: Farmer Cost of production / Acre

Farmer Cost of Production/ac -		With Proposed Fertilizer Subsidy		
		Normal Practice	Normal Practice	Normal Practice
Machinery	Rs/ac	9,000	9,000	9,000
Labour	Rs/ac	20,000	20,000	20,000
Seeds	Rs/ac	6,800	6,800	6,800
Agro Chemicals	Rs/ac	3,600	3,600	3,600
Fertilizer	Rs/ac	4,500	4,500	4,500
Processing	Rs/ac	4,000	4,000	4,000
Total Input Cost		14,900	14,900	14,900
Total Cost	Rs/ac	47,900	47,900	47,900
Yield	kg/ac	2,000	2,500	3,000
Cost of Production	Rs/kg	23.95	19.16	15.97
Farm Gate Price (avg. Dry)	Rs/kg	42	42	42
Gross Profit	Rs/kg	18.05	22.84	26.03
Total Income	Rs/ac	84,000	105,000	126,000
Gross Income	Rs/ac	36,100	57,100	78,100
Cost/Benefit		1.75	2.19	2.63

3. Animal Feed Industry Requirement

a. Feed Industry

Major portion of maize is utilized as poultry feed. It is estimated five largest feed millers require around 16,000 MT of maize per month which is around 50% of total maize requirement as a feed ingredient. The balance is consumed by a large number of small to medium scale feed producers. However, actual quantity utilized per month varies with maize availability, quality, price, use of substitute material, variable monthly demand for feed etc.

Table 4 : Poultry Feed production 2006 to 2015

Year	Poultry Feed - ('000 MT)	
2006	462	
2007	480	
2008	464	
2009	454	
2010	485	
2011	595	
2012	715	
2013	769	
2014	813	Growth
2015	924	13%

Source - DAPH / Census & Statistics

Considering poultry feed production volume in 2015 it is deduced the maize requirement, as a feed ingredient, is 38,000 MT per month on the basis 50% of feed formulation consists of maize. It is necessary to emphasize that this requirement could vary with several factors as mentioned above.

b. Quality

Poultry Feed Industry has specific quality standards for maize used as a feed ingredient that are mainly related to postharvest handling & storage conditions; key parameters are; moisture13-14%, aflatoxin 20ppb, broken & foreign matters 3%, free from weevils & other live insects. It is identified that a significant portion of maize harvest is not up to the expected feed industry requirement (actual data not available) due to inappropriate threshing & drying by farmers and poor storage and wrong handling by stockist.

4. Maize Supply Chain Dynamics

a. Supply chain

Maize supply chain for Feed Industry consists of 5 components as depicted below. The links between components are mostly informal and governed by the information available to them and speculation. It is noted that decisions in stocking and transaction pricing by different players are hindered due to lack of formal mechanism to share up to date information pertaining to extent sown, yield forecast, stocks held by stockist, quality of stocks, stocks held by feed millers & their production requirements among stakeholders.

Input supplie → Farmer → Collectors Stockist → Feed Millers

Out-grower operators

(Important Note - It has been dentified that some sub group in collectors & stockists, accordingly can be divided in to small and large scale basis. Currently it has identified more than 60 players of large/small collectors and stockists in both Anuradapura & Monaragala districts).

It is estimated that major feed millers have a storage capacity up to 100,000 MTs while few large scale suppliers owned capacity of 80,000 - 100,000 MT. In addition, a large number of small to medium scale stockists buy unspecified amount of maize production during the season and store for trading at a margin. Prolonged storage in some stores under improper conditions by this sector leads to quality deterioration. It is the general pattern that farmers sell their harvest to raise money for living and to meet cultivation expenses for the next season.

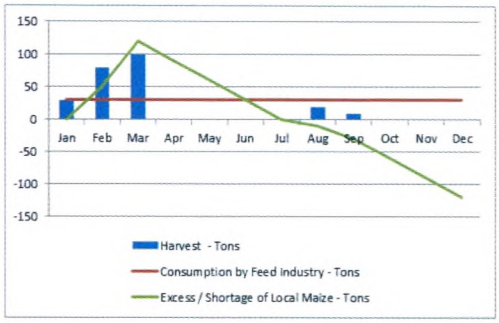
(Annexure 1 Shown; Distribution of sub categorized structure of Collectors & Stockists in Anuradapura & Monaragala districts)

b. Supply/Demand Scenario

Table 5:
Maize Stock Position in the supply Chain

Month	Harvest - '000 Tons	Consumption by Feed Industry / Month - '000 Tons	Stock of Local Maize in the supply chian - '000 Tons	Requirement of Imported Maize - '000 Tons
Jan	30	30	-	-
Feb	80	30	50	-
Mar	100	30	120	-
Apr	0	30	90	-
May	0	30	60	-
Jun	0	30	30	-
Jul	0	30	-	-
Aug	20	30		10
Sep	10	30		20
Oct	0	30		30
Nov	0	30		30
Dec	0	30		30
Total	**240**	**360**		**120**

Chart 1:
Monthly variance of local maize availability for Feed Industry



As per Chart 1 and Table 5, local maize supply becomes insufficient to meet feed industry requirement from mid-July. However, this point of breakeven stock could actually be a later date by 1-2 months depending on the amount of buffer / safety stock maintained by feed millers.

Chart 2 further shown that realistic maize supply calendar for feed millers based on local maize production

Chart 2:
Maize Supply Calendar for Feed Millers

c. Prices - Domestic

In 2012 treasury fixed minimum guaranteed price for maize at Rs. 32 per kg and at the budget 2015, presented in November 2014, it was proposed to review the minimum guaranteed price. Farmer selling price varies monthly; prices depend on; moisture level of maize, supply-demand, area of production and stocks in the supply chain etc. Farmers usually sell their production shortly after harvesting to collectors who visit the area or deliver by themselves to the collecting centers established by large scale buyers. Price is mainly determined during off-production months by market forces / supply-demand situation and how desperate feed millers to buy local maize. As chicken prices are regulated by feed millers they are compelled to maintain a certain maximum maize buying price to keep the industry sustained. They also have an option of substituting maize with other grains; often with rice – broken and substandard for human consumption. If there is an excess production of rice in the country and paddy prices come down sharply feed millers could substitute more rice in their formulations in place of maize.

d. Prices – Global

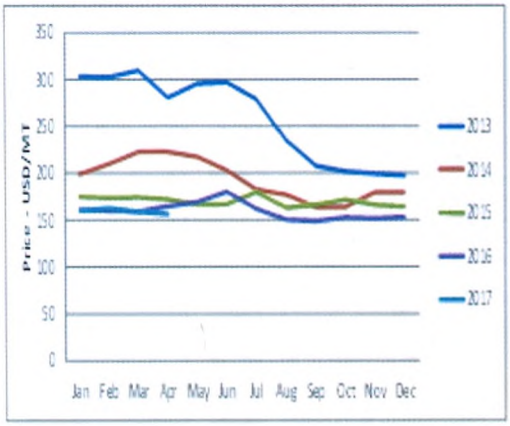
Maize is bought and sold by investors and price speculators as a tradable commodity using corn futures contracts. These "futures" are traded on the Chicago Board of Trade (CBOT) and prices are available on line. Two popular commodity price sources are PUBLIC LEDGER (on paid subscription) and Index Mundi (free online).

Table 6: US Maize Prices
FOB Gulf of Mexico in US$/MT

Month/Year	2013	2014	2015	2016	2017
Jan	303.29	198.72	174.71	161.03	159.99
Feb	302.5	209.32	173.7	159.68	162.88
Mar	309.49	222.33	174.23	159.14	158.97
Apr	280.27	222.36	172.05	164.41	156.44
May	295.29	216.92	166.3	168.92	
Jun	297.06	202.56	166.72	179.87	
Jul	278.93	182.23	179.6	161.76	
Aug	234.89	176.43	162.74	150.16	
Sep	207.41	163.06	166.01	148.43	
Oct	201.73	163.31	171.39	152.58	
Nov	199.14	178.67	166.08	151.3	
Dec	197.5	178.67	163.95	152.67	

Source: Index Mundi

Chart 3: US Maize Prices FOB Gulf of Mexico in US$/MT



e. Import

In order to meet deficit of maize for feed formulation in Sri Lanka the government issued import permits 86,000 & 87,145 MT respectively in 2015 & 2016 have been imported under the payment of Special Commodity Levy of Rs. 10/kg in place of usual import duties payable.

Import duty structure for maize HS code 1005.90 (http://www.customs.gov.lk/ tariff/ icess2015)

Gen. CID	15%
VAT	11%
PAL	5%
NBT	2%
Cess	35%
SCL	-

SUGGESIONS:

a. Farm gate price to sustain maize farming

It is suggested to treat farmer price as Rs. 40 per kg for cleaned & dried maize with 13-14% of moisture, in meeting with quality standards of Feed Industry (Table 3 - Farmer Cost of Production, Option 1). If and when farmers are unable to dry maize due to intrinsic limitations or wet weather such maize could be delivered to commercial dryers established in growing areas or price could be deducted from suggested price (Rs. 40/kg) in proportionate with moisture content.

b. Increase farmer productivity

The national average productivity of maize is 1.5 MT per acre, which is substantially lower than the achievable potential and the global average. An average up to 2.5 MT per acre can be achieved with Good Agriculture Practices (GAP), quality input package & close extension service.

c. Import License & Variable Special Commodity Levy to balance Farmer / Feed Industry interests

It is suggested to develop import license issuing procedure after evaluation of seasonal forecast of maize harvest, available stocks in the supply chain, and feed millers production forecasts. As existing import duty structure including Cess of 35% is prohibitive for already regulated poultry industry it is suggested to introduce Special Commodity Levy for the import of maize under import license.

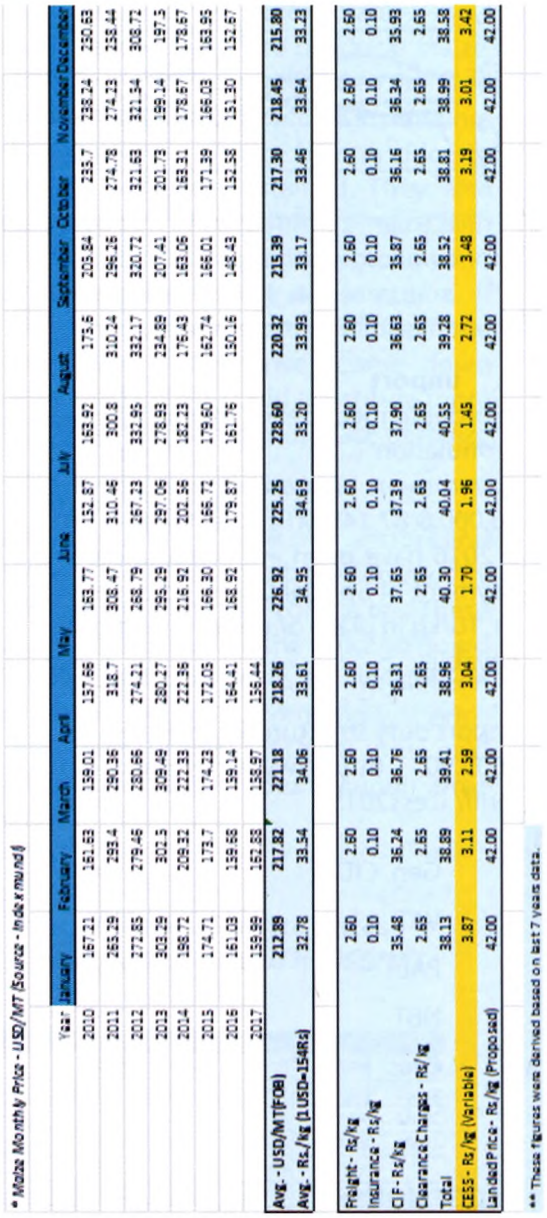
In order to keep local maize price at a minimum of Rs. 40 per kg, it is suggested to implement variable Special Commodity Levy applicable for a specific period based on a formula that captures price changes in the global market, which can be pegged to US FOB Prices / CBOT. FOB Gulf of Mexico prices as stated in Table 6 has changed remarkably from US$ 222/MT in April 2014 to US$ 172/ MT in April 2015 that justifies need to have a variable SCL mechanism. Therefore, it is suggested to introduce a formula to determine variable Special Commodity Levy based on US FOB prices to keep maize farmers continuing in

cultivation and a reasonable price of Rs. 42/kg to Feed Industry too as given below(Table 7), based on April 2017 US FOB prices . And Table 8 shows calculated figures on fixed landed cost (42 Rs/kg) with proposed variable special commodity levy based on last 7 years monthly imported maize FOB price of Gulf of Mexico.

Table 7: Scenario for Import Cost of Maize under variable Special Commodity Levy

	Unit	Apr-17
US Maize Price FOB	USD/Ton	156.44
Currency	Rs/USD	154
US Maize Price FOB	Rs/kg	24.09
Freight	Rs/kg	2.60
Insurance	Rs/kg	0.10
CIF	Rs/kg	26.79
CESS (should variable)	Rs/kg	12.56
Clearing Charges	Rs/kg	2.65
Ex Harbour Cost	Rs/kg	42.00

Table 8: Scenario for Import Cost of Maize under variable Special Commodity Levy (Based on last 7 years monthly FOB prices).



* Maize Monthly Price - USD/MT (Source - Index mundi)													
Year	January	February	March	April	May	June	July	August	September	October	November	December	
2010	167.21	161.69	159.01	157.66	153.77	152.87	153.92	175.6	205.84	235.7	238.24	230.63	
2011	263.29	283.4	280.36	318.7	308.47	310.48	300.8	310.14	286.26	274.78	274.13	238.44	
2012	273.83	279.46	280.66	274.11	268.79	267.13	332.95	332.17	320.72	321.63	321.34	308.72	
2013	303.29	301.5	309.49	280.27	295.29	297.06	278.93	234.89	207.41	201.73	199.14	197.5	
2014	198.72	209.32	222.33	216.92	202.38	181.23	176.43	163.06	168.31	178.67	178.67	178.67	
2015	174.71	173.7	174.23	172.03	166.30	166.72	179.60	162.74	166.01	171.39	166.03	163.93	
2016	161.03	159.68	159.14	164.41	168.92	179.87	161.76	150.16	148.43	152.58	151.30	152.67	
2017	159.99	162.88	158.87	156.44									
Avg. - USD/MT(FOB)	212.89	217.82	221.18	218.26	226.92	225.25	228.60	220.32	215.39	217.30	218.45	215.80	
Avg. - Rs./kg (1USD=154Rs)	32.78	33.54	34.06	33.61	34.95	34.69	35.20	33.93	33.17	33.46	33.64	33.23	
Freight - Rs/kg	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	
Insurance - Rs/kg	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	
CIF - Rs/kg	35.48	36.24	36.76	36.31	37.65	37.39	37.90	36.63	35.87	36.16	36.34	35.93	
Clearance Charges - Rs/kg	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	2.65	
Total	38.13	38.89	39.41	38.96	40.30	40.04	40.55	39.28	38.52	38.81	38.99	38.58	
CESS - Rs/kg (Variable)	3.87	3.11	2.59	3.04	1.70	1.96	1.45	2.72	3.48	3.19	3.01	3.42	
LandedPrice - Rs/kg (Proposed)	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	

** These figures were derived based on last 7 years data.

Note : Freight cost could vary based on port of loading, packing, & prevailing freight rates

SOCIAL MEDIA - FOE OR FRIEND FOR SRI LANKA ?

Yasas V Abeywickrama

The writer is a long standing industry activist and an author/ writer. He has taken a keen interest on social media and its governance in recent times.

In March 2018, Sri Lanka experienced ethnic tensions and the government banned social media platforms such as Facebook, Viber and Whats App among many other steps, to bring the situation under control. This created interested among many to discuss about the role of social media in the context of hate speech and fueling ethnic tensions.

Sri Lankans are notorious to forget things quickly, so everyone seems to have forgotten what happened. However the responsible citizens should continue to engage in discussions and contribute to ensuring that such a situation does not happen again.

When I say 'such a situation', I mean never again we should see ethnic violence in this country and never again should we see an internet or social media ban in this country.

With my interest in the topic, I have listed some of the ideas I like to put forward in this context. However, these are my own ideas and opinions and do not form the opinion of any organization that I am attached to.

The free access to internet should be respected as a key principle. It is a fundamental right in today's context.

Freedom on social Media should also be upheld, however, when crossing the lines that are acceptable within humanity, we need to have measures to tackle those who do such things.

While accepting that social media was banned in March 2018 for national security reasons, it must be stressed that never again in the future of Sri Lanka, such total bans should be implemented without proper assessment and consultation. The process that was followed in banning social media and controlling internet is not known and in a democratic country, we need to review what processes should be followed in such situations.

Social media may have helped tensions grow and riots start, however, it has to be noted that there was significant delays on proper actions being taken when the incidents in Ampara happened as well as even after the vehicle accident in Kandy. After all other systems failed to respond, blaming it all on social media is incorrect.

While such internet and social media total bans are unacceptable in a democratic society, even strict laws like in China or new laws in Germany are also not healthy for democracy. People today expect freedom and access, and if they are blocked in whatever the form, they will respond in other ways.

It has to be noted that bans are ineffective as people will use VPNs and other technology workarounds.

Social Media just like other modes of communication are used for various malpractices such as pornography, fraud, black mailing, fake news spread etc. But bad actors aren't the majority, there are only a few and they are far between. The laws should be brought into handle these, but in no way should social media or internet be restricted. However lets not forget that what we see online is a reflection of the actual society. Even without the involvement of social media, bad things happen in the society. So blaming it all on social media isn't accurate. However law reforms in a need.

It is important to work with social media companies (platforms) to ensure some of the issues arising on platforms such as fake news, fake accounts, pornography, and use for fraudulent activities are handled effectively by the platform.

To tackle those who cross the lines by using social media for fake news, fake accounts, pornography, and use for fraudulent activities, law reforms can be looked into. However this is a very different approach than looking at banning or restricting. Just like there are laws to handle offline issues, online world also need certain laws in place, and Sri Lanka is quite primitive when it comes to cyber laws, internet related laws, data protection laws, privacy laws etc and it is not clear which government organisation actually provides thought leadership in these matters today but they are quite crucial in the world we live in today.

It is also noteworthy that there have been only a few cases of official reports from Sri Lankan authorities to social media platforms on wrong doers, therefore effective readiness systems needs to be developed in Sri Lanka. These are more effective than bans, which are detrimental to the democracy.

Social Media companies also needs to be more culturally sensitive and responsive. When certain hate posts spread either on racial, gender or any other matter, it is important that there is some local and contextual sensitivity is applied, and quickly responded to the situation.

Social Media has given voice to the people. It has created avenues for the people for their life, business, relationships, entertainment and many more. However, just like the society on the ground, it has issues and those need to be tackled foresightedly.

CULTURAL COMPETENCE OF NURSES IS A NEED IN GLOBALIZATION

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What is globalization ?

Globalization is the process of integration and interaction between people, companies and governments worldwide. International trade, ideas and culture have grown with increased global interaction. Furthermore globalization is primarily an economic process of interaction and integration that is associated with social and cultural aspects. According to literature globalization is subdivided into three major parts: economic globalization, cultural globalization and political globalization (Wikipedia, 2018)

Cultural globalization refers to the transmission of ideas, meanings and values around the world in such a way as to extend and intensify social relations. The process of globalization is marked by the common consumption of cultures that have been diffused by the use of internet, popular culture media and international travel. With these advancement exchanging cultures is common around the globe and it empowers the individual to extend social relations. Globalization brings increasing interconnectedness among different populations and cultures. Similarly health care providers worldwide correspondingly meet different populations and cultures constantly. Therefore cultural competence is a

requirement to provide health care around the world.

What is cultural competence in health care ?

Cultural competence in health care refers to the ability for health care professionals to exhibit cultural competence to patients with diverse values, beliefs and feelings. The goal of cultural competence in health care is to reduce inequalities and to provide optimal care to patients regardless of their race, gender, ethnic back ground language

and religious or cultural beliefs (Wikipedia, 2018).

The term cultural competence was first used by Cross and Colleagues in 1989. However, it is cultivated for health care professionals at present. Cultural competence is a process that requires cultural knowledge, Cultural skills and Cultural attitudes. The first nursing theorist who described the cultural competence was Madeline Leininger. She discussed one should learn and understand cultural diversities and universalities that lead to culturally appropriate care. According to her theory, new technology kept a distance between nurse and client and replace hands-on assessment or care. These are barriers for the development of cultural competence (Carey, 2011).

Subsequently, cultural competence has been identified as a process by Campinha Bacote and it was defined as "the process in which the health care provider continuously strives to achieve the ability to effectively work within the cultural context of a client (individual , family or community) " (Campinha-Bacote ,1998 , P.6). This model is currently used as a framework for health care providers and for nursing education. The process of cultural competence in the delivery of healthcare services (PCCDHS) has drawn upon the works of Leininger and McFarland (2006), Kleinman (1980), Pederson (1988), Law (1993), Wood (1998), Cross et al. (1989), and Chapman (2005)(as cited Campinha-Bacote, 2011). According to Campinha-Bacote model cultural competence is constructed with five areas, cultural awareness, cultural knowledge, cultural skill, cultural encounter and cultural desire.

- **Cultural awareness**

Campinha-Bacote (1999) states "Cultural awareness is the deliberate, cognitive process in which health care providers become appreciative and sensitive to the values, beliefs, lifeways , practice and problem solving strategies of clients' cultures " (P.204).

The health care providers must explore in-depth regarding own prejudices and bias towards other cultures as well as own cultural back ground. Without being aware, health care providers cannot ensure culturally responsive care. It is important for health care providers to identify personal and professional prejudices and biases before addressing the different cultures. It helps the care providers to enhance interactions.

- **Cultural Knowledge**

According to Campinha-Bacote (1999) "Cultural knowledge is the process of seeking and obtaining a sound educational foundation concerning the various world views of different cultures" (P. 204).

The main goal of cultural knowledge is to understand the patients' behaviours and world views. Also there are cultural variations regarding physical, biological and physiological background among ethnic groups. Therefore health care providers should identify these differences to provide culturally competent care. Such as skin colour, genetic, hereditary etc.,because some psychological and biological

variations affect the way of drugs metabolizing.

- **Cultural skill**

Campinha- Bacote (1999) states "Cultural skill is the ability to collect relevant cultural data regarding the client's health histories and presenting problems as well as accurately performing a culturally specific physical assessment" (P. 204).

Health care providers can get information through the cultural assessment using a relevant tool to identify the client's cultural perception of the presenting problem and possible treatments and care to get an assessment in a holistic way.. Conducting a cultural assessment also prevent cultural blind spot syndrome that means health care providers always think the clients do not have cultural differences or cultural barriers. Cultural skill and cultural sensitivity is required to perform physical assessment for the ethnically diverse patients.

- **Cultural desire**

Compinha- Bacote (1999) defines "Cultural desire is the motivation of health care providers who "want to" engage in the process of cultural competence "(P. 205).

If health care providers do not have cultural desire they cannot give cultural competent care because every ones' words and actions are congruent with their inner feelings.

- **Cultural encounter**

Campinha- Bacote (1999) states "Cultural encounter is the process which encourages health care providers to engage directly in cross cultural interactions with clients from culturally diverse back grounds " (P. 205).

PCCDHS has undergone several major revisions from 1991 to 2010. According to the most recent version beginning point of the cultural competence is cultural encounter. The Cultural encounter's main goal should be to continuously interact with patients from culturally diverse back grounds to develop cultural knowledge, cultural awareness and cultural skills. However health service providers need to recognize the patients who may not represent cultural beliefs, values and practices of their culture. Therefore continuous cultural encounters are necessary to become culturally competent individual.

Campinha-Bacote discussed as a result of cultural encounter health care providers can improve other areas of cultural competence which are cultural awareness, cultural knowledge, cultural skill and cultural Desire. For example when nurses meet cultural diverse patient (cultural encounter) they can expand the cultural knowledge towards the specific cultures of the patient. When asking the questions about patients' cultural back ground it is necessary to develop cultural skill to collect relevant data according to the culturally based assessment in a culturally sensitive manner. Furthermore cultural assessment give rise to some personal biases and prejudices necessitate to develop cultural awareness and motivate cultural desire (Campinha-Bacote, 2011). Therefore eventually nurses can improve

cultural competence through cultural encounter.

3. Why cultural competence is important for nurses?

Cultural diversity is dramatically increasing in the world because of globalization. This cultural diversity challenges to the health care providers especially nurses to provide competent care to the diverse populations. For example United States, New York, and California have faced to this challenge (Martin, 2008). Similarly, Sri Lankan nurses are facing to this challenge because various ethnic groups are living in Sri Lanka though it was not officially declared as a multicultural country. Population of Sri Lanka is about 20,962,913 (worldometers, 2018) and people are ethnically, linguistically and religiously diverse. There are Sinhalese, Sri Lankan Moor, Sri Lankan Tamil and Indian Tamil minorities. Smaller minorities comprise the Malays and Burghers while the Sinhalese people speak Sinhala as their mother tongue, the Tamil people speak Tamil. English language is also widely used. The majority of moors and Indian Tamils speak Tamil as their first language (Wikipedia, 2018). According to the 2012 census Buddhists make up 70.1% of the population, Hindus 12.6%, Muslims 9.7% and Christians 7.6%. Most Sinhalese are Buddhist, Most Tamils are Hindus and Moors and Malays are mostly Muslim (Wikipedia, 2018). Therefore cultural competence is a crucial need for the health service providers to deliver culturally appropriate care in Sri Lanka.

Nursing care should be individualized and this individualization should include caring based on the cultural racial and ethnic diversity of patients and their families (Martin, 2008). That means nurses should have cultural competence and if not, lack of cultural competence in health care contributes to health disparities. For instance, the plan of care should be in a way that is sensitive to the needs of the patient and the family. If nurses ignore the cultural back ground it could cause the patient to be noncompliant with treatment or refuse care. Researchers also have demonstrated that a lack of cultural competence contributes to health disparities and poor health outcomes (Betancourt, Corbett & Bandaryk, 2014). Health care disparities create health care issues that are costly for patients and families as well as health care systems. This deficiency in cultural competency creates a gap between the nurse and safe patient centred care. So the necessity of cultural competence for health care providers especially for nurses is clear.

Furthermore Canadian Nurses Association (CNA) believes that cultural competence is an entry to practice level competence for registered nurses (CNA, 2010). Several studies which examined the nursing care abilities of baccalaureate nursing students as well as professional nurses reported low cultural competence (Alpers & Zoucha ,1996 : Baldonado et al ,1998 : Bernal & Froman , 1987,as cited in Sealy, 2003) and some researchers discussed nurses have moderate cultural competence and need to develop it (Cicolini et al. , 2015; Senarathne & Meegoda , 2018).

AFFIRMATIVE ACTION : IN PURSUIT OF SUBSTANTIVE EQUALITY

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Synopsis

This paper examines the scope and application aspect of affirmative action as a means to achieve substantive equality. Four countries namely, Sri Lanka, United States, India and South Africa have been studied in this regard. The relevant constitutional provisions and case law have been dealt with. What is important to remember is that the object of benign discrimination or affirmative action is the assurance of equality. A mere constitutional declaration would not make a minority, downtrodden for centuries, enjoy equality with others. Affirmative action must be taken in areas such as employment, housing, agriculture and university admissions. The United Nations too has recognized the need for affirmative action in Article 1.4 of the International Covenant on Elimination of All Forms of Racial Discrimination of 1966. The Affirmative action is not a refinement or extension or an exception to the principle of equality, but its necessary corollary. It is applicable whenever unequals are being considered. However, all differential treatment need be justified to remedy the present effects of past discrimination and not to perpetuate fix quotas.

Introduction

The universalism of life demands that all people treat all others equally, without discrimination. This principle of equality has been the driving force for human rights. It is also one of the pillars of human development, which emphasize equality in opportunity and choices. The 20th century's progress towards equality – regardless of gender, race, religion etc, was propelled by social movements. Yet, discrimination still continues to be a part of our lives. Norms may have changed but not far enough and not in all important areas. Non- discrimination and equality may be formally recognized in laws, but there is still discrimination in policies, resources allocations and public provisioning of social services.

It is imperative that the distinction between formal equality and substantive equality be made since most often the attainment of formal equality is accepted as attainment of the freedom to exercise rights freely. The formal approach concentrates on the treatment of all persons who are alike in the same manner. The treatment of a person of a group, for example, a particular race, in a manner different to that of other persons of the same race or group would be seen as discrimination by the formal approach. The substantive approach on the other hand, is not only concerned with equal treatment of the law but also with the actual effect of the law. This approach takes into account socio economic inequalities and puts forward positive measures for the elimination of these inequalities. Substantive equality seeks to eliminate systemic and institutional discrimination against disadvantaged groups. The goal of formal equality is

essentially to achieve the same treatment for all, whereas the goal of substantive equality is to eradicate inequality. The duty of the Government in the case of formal equality is to avoid discrimination by treating people differently in their laws and in their policies etc. In the case of substantive equality the Government has a positive responsibility to level the playing field for those who experience inequality. The affirmative action is a means in the form of set of laws, policies and administrative practices to achieve substantive equality.

2. Country perspectives

2.1. Sri Lanka

The 1978 Constitution of Sri Lanka guaranteed the right to equality before the law and the equal protection of the law in Article 12(1) and along with it paragraph (2) prohibited discrimination on the ground of race, religion, language, caste, gender etc. There was however, an express provision in Article 12(4) enabling a type of affirmative action , albeit in very narrow terms couched as follows :

'(4) Nothing in this Article shall prevent special provision being made by law, subordinate legislation or executive action, for the advancement of women, children or disabled persons'.

From one point of view this was not a radical departure from the equality principle as this provision may be regarded as a specific instance of rationale 'classification' which is permissible under the equality principle. It is not a contradiction of the right of equality which only requires that persons similarly situated be treated equally and does not require it when there is manifest inequality between persons which justifies special treatment. It is plain that women, children and disabled persons in particular circumstances need special measures for their protection and advancement. There can be little controversy on this but different considerations would apply in cases when men and women compete on equal terms as there would be no rationale ground for treating them differently.

Seneviratne v University Grants Commission (UGC)1

In Seneviratne v University Grants Commission (UGC) the petitioner challenged the quota system adopted by the respondent UGC with regard to admission to the public university system on the basis that it violated Article 12(1). This case concerned admission to universities. In this case the scheme of admissions to the Universities provided for 55% of the places available to be distributed on the basis of ratio of population among the 24 administrative district : 15% of the places were to be apportioned at the discretion of the University Grants Commission among 13 districts which were considered to be underprivileged and 30% of the places were to be decided solely on merit. The challenge was directed to the said allocation of the 55%. The respondent UGC submitted to court that by reason of the educational – socio economic circumstances of Sri Lanka and the unequal secondary education facilities provided mainly by the Government, the determination of entry to the Universities based solely on the aggregate of raw marks of a candidate cannot be accepted

as the sole criterion for higher education. Further as the Commission contended, it must conform to national policy. Directive Principles of State Policy contained in Article 27 of our Constitution declare that the State is pledged to establish a democratic socialist society. The objectives among others include complete eradication of illiteracy and the assurance to all persons of the right to universal and equal access to education at all levels.

Wanasundara J., upholding the classification stated that the increasing number of students pressing for admissions and the woeful lack of teachers and facilities in most of the Provinces had compelled the authorities to modify the merit principle to meet the ends of justice. The departure from the merit principle, though unfortunate is inevitable. The Judge referred to, with approval Kesavananda Bharati v State of Kerala 2 and State of Kerala v Thomas3, where the Indian Supreme Court had given the Directive Principles of the Indian Constitution a place of honour in the Constitution.

Ramupillai Judgment 4

The question of constitutionality of ethnic quotas in promotions in public service was considered in Ramupillai v Minister of Public Administration, Provincial Councils and Home affairs and Others, a matter referred to a Bench of seven Judges. In the ethnic determination of this case constitutional provisions relating to equality were applied. The quotas were introduced by two Public Administration Circulars issued in pursuance of a Cabinet decision. According to Circulars recruitment and promotion at national level would be on the national ethnic proportion. The ethnic ratio thus applied was Sinhalese 75%, Tamil 12.7%, persons of Indian origin 5.5% and Muslims 8%. The petitioner, a Superintendent of Customs, was an applicant along with 15 other Superintendents for 22 vacancies in the grade of Assistant Director. Of the first twenty two persons eligible for promotions, 15 were Sinhalese and 7 were Tamils. The petitioner was 10th in the order of seniority and would have been promoted if not for the ethnic quota. On the application of the ethnic quota, 19 Sinhalese and 3 Tamils would be promoted, but the petitioner would be left out as he was the 5th Tamil in the list.

The Supreme Court, by its unanimous opinion, struck down the circulars in so far as they applied to promotions. The question whether ethnic quotas applied at initial recruitment is constitutional was left open. The Court held that the Superintendent of Customs formed a single class. All of them should have equal opportunity of advancement of their career in the public service irrespective of race, caste, religion etc. The leading judgment in this case was by Mark Fernando J. The learned Judge explained that paragraph (2), (3) and (4) of Article 12 are essentially explanatory and declaratory of the principle of equality. Affirmative action is not an exception to the principle of equality but its necessary corollary. Fernando J. stated that differences in respect of immutable factors such as race, ethnicity and ancestry, caste, sex or place of birth do not per se render persons unequal. Differential treatment of citizens on account of factors set out in Article 12(2) is prima facie unconstitutional but there seems to be no such presumption in the case of other factors. The learned Judge

stated that differential treatment must be for a legitimate object only. If in relation to a legitimate object, their race reasonably makes persons of one race a distinct class, they may be equally treated. The same is true of sex, religion and political opinion. Thus, for the legitimate object of appointing a suitable person as a matron of a girl's hostel, male may be excluded. In appointing a teacher of a particular religion, persons of other religions may be excluded.

Even where race would not normally afford a permissible basis of classification, differential treatment would be justified on proof of special circumstances. Fernando Judge emphasized that race specific remedies may be devised, precisely tailored to 'make whole' actual victims of proven racial discrimination. Affirmative action can devise relief for victims of societal discrimination such as American Negros. Discrimination must be objectively established by evidence or by relevant findings of competent bodies. Perceptions and opinions are insufficient. The object of affirmative action is to remedy the present effects of past discrimination and not to perpetuate fixed quotas.

The learned judge further stated that racial quota cannot be imposed simply for the purpose of correcting an existing racial imbalance, except perhaps where there is serious, chronic, pervasive under - representation or over- representation sufficient to raise a presumption of past discrimination.

Fernando J. took the view that affirmative action is permissible both at the stage of recruitment and promotion, where necessary proof exists, but the proposed remedy would be more strictly scrutinized in the case of promotions on account of other compelling needs and interests such as efficiency, higher levels of responsibility involved upon promotion and the legitimate expectations of employees that merit and devoted services would be rewarded. Applying the above principles, the learned Judge held that the State had failed to establish the justification for departure from the merit principle.

2.2. The United States of America (US)

In the US the affirmative action is a set of laws, policies guidelines and administrative practices intended to end and correct the effects of a specific form of discrimination. These include government mandated, government sanctioned and voluntary private programs that tend to focus on access to education and employment, granting special consideration to historically excluded groups, specifically racial minorities and women.

In the United States, affirmative action tends to emphasize not specific quotas but rather 'targeted goals' to address past discrimination in a particular institution or in a broader society through good faith efforts to identify select and train potentially qualified minorities and women. For example, many higher education institutions have voluntarily adopted policies which seek to increase recruitment of racial minorities. Outreach campaigns, targeted recruitment, employee and management development and employee support programs are examples of affirmative action in employment.

The US Affirmative action polices were developed to address long histories of discrimination faced by minorities and women, which reports suggest produce corresponding unfair advantages for white and males. They first emerged from debates over non discrimination policies in the 1940s and during the Civil Rights Movement. In 1961, President John F Kennedy became the first to utilize the term 'affirmative action' in its contemporary sense in Executive Order 10925 to ensure that government contractors take affirmative action to ensure that applicants are employed and employees are treated during employment without regard to race, creed, colour and national origin. Title VII of the Civil Rights Act of 1964 prohibits racial discrimination in firms with over 25 employees.

In the US a prominent form of racial preferences relates to access to education particularly avenues to universities and other forms of higher education. Race ethnicity national language social class geographical origin, parental attendance of the university in question and / or gender are sometimes taken into account when the university assesses an applicant's grades and text scours. In early 1970s Administrators of Harward University invented the Harward plan, one of the country's earliest and most effective affirmative action programs, which became a model for other universities around the country.

Bakke Case5

The first major US Supreme Case dealing with affirmative action was Regents of the University of California v Bakke. The Medical School of the University of California at Daves had adopted an affirmative action plan that sets aside 16 % of the places in its entering class for disadvantaged minority students. By a five to four vote, the Court struck down the plan as violating equal protection. Since the programme at Davis totally excluded whites from a specific percentage of places while preferred applicants had the opportunity to compete for every place. But at the same time the Court upheld the general principle of affirmative action and determined that consideration of an applicant race could be a constitutionally permissible factor in university admission provided that it was part of a properly devised admission program. Four judges who formed the minority upheld the Davis's special program. They said that the program did not operate to stigmatize or single out any discrete and insular or even an unidentifiable non-minority group. Its purpose was to overcome the effects of segregation by bringing race together.

The Court also dealt with the purposes that the special admissions programmes purported to serve and which the University claimed served an important governmental objective. The Court held that the US Constitution forbade a purpose that sought to assure within the student body some specified percentage of a particular racial group. A classification that aids persons of a relatively victimized group at the expense of other innocent individuals would not be approved unless there are judicial, legislative or administrative findings of such victimization and its extent and the remedial action proposed inflicts the least possible harm to such

innocent persons competing for the benefit. In the instant case the Court stated that there were no such findings. The Court stated that the attainment of a diverse student body was a permissible goal. However, the majority refused to accept the argument that a racial quota was the only effective means of serving the interest of diversity. The Court stated that assignment of a fixed number of places to a minority group is not a necessary means to achieve diversity.

Grutter Case 6

In Grutter v Bollinger, the US Supreme Court ruled 5 to 4 vote that race could be used as one of several factors in professional school admissions without necessarily violating the Equal Protection Clause of the 14th Amendment. The Court found that the University of Michigan law school's narrowly tailored policy which considered race and other factors, with no quota or pre determined weight associated with the factors , was constitutional and appropriate 'to further a compelling interest in obtaining the educational benefits that flow from a diverse student body. The Court emphasized the need to limit race – conscious admissions polices in time . Enshrining a permanent justification for racial preferences would offend this fundamental equal protection principle. The Law School too conceded that all race – conscious programmes must have reasonable durational limits. The durational requirement can be met by periodic reviews to determine whether racial preferences are still necessary to achieve student body diversity.

Affirmative action is a subject of controversy in American politics. One popular argument for affirmative action is compensation. Blacks were mistreated in the past for being black so society today should compensate for the injuries. This causes reverse discrimination in the form of preferential hiring contracts and scholar ships as a means to ameliorate past wrongs. Opponents of affirmative action suggest that merit should be the primary factor considered in applying for job positions, college and graduate schools etc. Opponents of affirmative action argue that these policies amount to reverse discrimination which entails favouring one group over another based upon racial preference rather than achievement and many believe that affirmative action policies succeeded and are no longer required. In particular, policies adopting racial quotas or gender quotas have been criticized as a form of reverse discrimination. The opponents argued that it hinders reconciliation, increase racial tension, replaces old wrongs with new wrongs, undermines the achievements of the minorities.

2.3 . India

In India while Article 14 of the Indian Constitution guarantees the right to equality before the law and equal protection of the laws, Articles 15, 16 and 17 spell out some specific areas of non discrimination. Article 15 provides that the State shall not discriminate against any citizen on grounds only of religion, race, cast, sex, place of birth or any of them, and that no citizen shall be subject to disability or restriction on any of these grounds with regard to access to shops, public restaurants, hotels and places for public entertainments or use of wells, tanks, bathing ghats, roads and places of public resorts maintained wholly or partly out of

State funds or dedicated to the use of the general public. There are two exceptions to the operation of Article 15. Firstly, it will not prevent the State from making any special provisions for women and children. Secondly, it will not prevent the State from making any special provisions for advancement of any socially and educationally backward class of citizens or for the Scheduled Castes and Scheduled Tribes.

Article 16 provides equality of opportunity for all citizens in matters relating to employment under the State. It provides that no citizen shall on grounds only of religion, race, caste, sex, descent, place of birth, residence or any of them, be ineligible for or be discriminated against in respect of, any employment or office under the State. An exception is provided to this principle. There may be reservation of posts in favour of any backward class of citizens which in the opinion of the State, is not adequately represented in the services of the State. A special provision may also be made for reservations in matters of promotions in favour of Scheduled Castes and Scheduled Tribes. Article 17 abolishes 'untouchability'.

To qualify for being called a backward class citizen under Article 16(4), one must be a member socially and educationally backward class or Scheduled Caste or Scheduled Tribes. In view of this it is not permissible to waive the requirement of minimum educational qualifications and other standards essential for the maintenance of efficiency of services. The reservation should not be excessive that it practically denies reasonable opportunity of employment to members of other communities. The provision for reservation in appointments and posts under the State should satisfy two conditions, firstly, the class of citizens in favour of which reservations is made should be socially and educationally backward; and secondly, the particular backward class has no adequate representation in the given public service. In A.B.S.K. Sangh v Union of India7 the Indian Supreme Court went into the question of reservation in public services. The Court upheld the validity of certain circulars of the Railway Board in which the reservations were made in favour of Scheduled Castes and Scheduled Tribes in the matters of promotions in railway services. The Court held that the State can make classification based on substantial differentia, groups or classes. Therefore, the fundamental right to equality of opportunity has to be read as justifying the classes of Scheduled Castes and Scheduled Tribes separately from the rest of the community with the object of providing adequate representation in services under the State.

2.4. South Africa

Article 9(2) of the South African Constitution recognizes the validity of measures taken to protect or advance persons or categories of persons disadvantaged by unfair discrimination. In this section, persons covered under affirmative action programs are broadly defined, as persons or categories of persons disadvantaged by unfair discrimination, unlike Article 12(4) of the Sri Lankan Constitution or Article 15(2) and 16(2) of the Indian Constitution. In the Grootboom case8 the South African

Constitutional Court found that community's right to have access to adequate housing under section 26 of the South African Constitution had been violated. The applicants about thousand men, women and children lived in the West Cape where influx control policies were implemented. The State's extensive housing programs as an affirmative action program instituted through both legislature and other measures although a major achievement, failed to provide in any way for these people in disparate need. The housing plan provided for the progressive realization of access to formal housing to be accessed through a waiting period of up to seven years or even longer. this was so in essence because the government's housing plan did not pass the threshold of reasonableness contemplated by section 26(2) of the South African Constitution. The Court held that in order for a legislative policy framework aimed at the progressive realization of economic and social rights to be regarded as reasonable, it must be adequate and be comprehensive, coherent and balanced and flexible.

Justice C.G.Weeramantry9 lists three problems connected with affirmative action which needs to be addressed in dealing with such affirmative action programmes: the extent to which favour treatment is self defeating in its objects by acting as a damper to effort; resentment by those who see it as a principle of injustice to others; and the burden imposed on the generality by the special treatment of the few. Each community, Justice Weeramantry states must resolve these problems in the light of its background, its experience and its mores.

The affirmative action is not a refinement or extension or an exception to, the principle of equality, but its necessary corollary : it is applicable whenever unequals are being considered. However, all differential treatment need be justified to remedy the present effects of past discrimination and not to perpetuate fixed quotas.

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TELEMEDICINE : IS SRI LANKA READY ?

Dr. Gumindu Kulatunga

In human development, telecommunication and medicine have always been close allies. The first telephone call made by Alexander Graham Bell, on10th March 1876, was health-related requesting help from his assistant after Sulphuric acid spilled over Bell's hand.

At the moment there are many telemedicine implementations in Sri Lanka, and many more are blooming up rapidly. People, as well as the government, should identify telehealth systems to obtain optimal health care through telehealth.

Telemedicine can be defined as the exchange of medical information such as patient history, examination findings (e.g. auscultation sounds, blood pressure, saturation, photographs of clinical conditions), and investigation results (e.g. lab results, ECGs, radiographs, MRI scans and CT scan reports) using telecommunication and information technology between two or more parties separated by space/distance, by time or both, to improve a patient's clinical health status. Involved parties can be doctor vs patient as well as between two doctors discussing about patient care. Aim of the practice is for diagnosis and treatment of a person's disease condition.

Types of Telemedicine.

- Live two-way discussion between physician-patient

Synchronous live video conferencing

Asynchronous (store-andforward)

- Not connected live, but patient later receives a recorded answer for his/her query made earlier

- Patients' clinical information is sent to a doctor in a different location

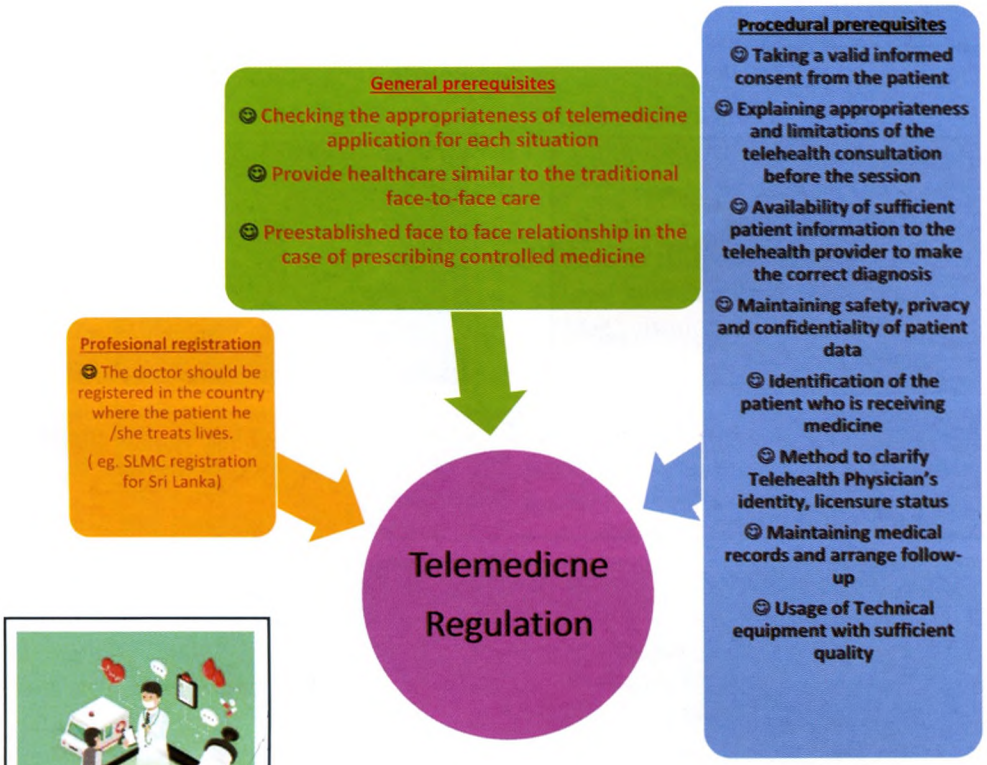
Remote patient monitoring

Mobile health

Health messages transmitted to patients' mobile phones.

Prerequisites to Telemedicine

There are many recognized prerequisites that need to be fulfilled to initialize a telemedicine session in many other countries. Some of them are :



Where is Sri Lanka ?

Sri Lanka currently doesn't have legal legislation or a guideline particularly addressing the practice of telemedicine within Sri Lanka, in line with above requirements which are used in most countries that utilize telemedicine. Therefore proper scientific research is needed urgently in this field of telemedicne to identify telemedicine needs of the public as well as the health professionals who are willing to provide telecare.

IT'S TIME YOUR BUSINESS GO PAPERLESS,

Because they are killing the environment, in disguise of you doing business.

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Businesses have been planning to save the environment. Giving due consideration to triple bottom line and promising that they will protect the "planet". Yet, they have not taken a considerable effort to eliminate paper usage in their businesses, which has double benefits. If businesses can eliminate paper, approximately 20% of cost could be saved in a typical service business. As the business grows, paper manufacturers cut down more and more trees, businesses incur more and more costs to purchase such paper. This race can be eliminated if businesses take initiative to cut down on paper usage. So it's your turn Mr. Business executive to take action.

I know your answer, it's not as easy as you think. There are many concerns businesses that need to be addressed. What I am discussing in this article is how such issues could be addressed.

We have deliberated and identified the uses of paper in businesses. Businesses use paper for only two purposes. 1. for communication, 2. For maintaining evidence. Latter use has been more applicable more in businesses. You print reports as evidence of a static picture of the businesses. Sometimes you get the signature of people and retain the paper for evidence. A customer deposits/withdraw money and the bank will hold the vouchers. Company pays salaries and print payroll and such will be stored for future reference. All are evidence. A manager will receive a report from a subordinate, the manager may sign the copy he/she received with the date and store it somewhere. The worst part of the story is that companies pay millions of rupees on annual basis for storing and caring for such gathered evidence. At the same time, even though the paper is used for communication, they will be retained as evidence of communication. Someone may initiate the communication by writing "see" and placing the date. All these are practices of generating paper.

When we conducted a "paper generation audit" we identified two types of papers we are holding onto. 1. Paper generated from inside as a result of organizational activities and their evidence. 2. Documents that are generated from outside and received into the organization, which become inputs to organizational processes. Thus, the process of eliminating paper should be looked at from two alternative paths. Strategies for such will have to be discussed in another article.

In my experience, the major resistance for paperless business comes from Auditors. They are the people who go through the evidence. They are the people who will attempt to reverse-identify or verify the events occurred within the business by going through paper evidence. On the other hand, these paper evidence are maintained for judicial purposes or in a lesser account, just-in-case they are required for disciplinary inquiries. Difficulty in going paperless is the concern "how can I present this evidence to auditors/inquiries just-in-case or in front of courts". We have failed to find an answer to this question, internally we have failed to convince the auditors that we can do without papers. Let us try to find an answer to this question.

We went through a rationale thinking process going back in time, to understand this situation. When the entrepreneur hands over the business to his/her agents, most probably the evidence requirement may have been established to account for the money spent by the agent. Thus, the practice of keeping evidence might have been brought into a complex level. Just think of accountant not writing Cash cheques. It is not because the bank does not allow writing cash cheques, it may be that accountants want to keep evidence in the account of how the entrepreneur's money is used and who benefited it. Accounting systems are designed to maintain such evidence for all transactions. At the same time, all systems that are designed for companies are designed to maintain evidence, even the Quality Management Systems like ISO are geared for same. However, the newest ISO version is focusing on relying less on evidence. However, going paperless in no way means eliminating or reducing evidence. The system we are proposing will maintain evidence at the present level of business maintaining evidence, maybe even better. IT/IS gives the best support for such systems.

We need to shift the paradigm of the basic concept of IS in order to understand the usage of IT for paperless businesses. The usual definition of "Data" needs to be changed. We advocate that data are the evidence of business events. For instance, when you make a payment, the receipt you receive on behalf of the business is an evidence. The concept of IS is to accumulate such evidence and process them to be informed. For instance, when an employee applies for leave, the leave application is an evidence for the employee requesting leave (event) and when the manager approves the leave, and same will become an evidence of leave being approved (event). In this manner IS are collecting and processing evidence as data and process them to make meaning of events that occurred in the businesses. In fact, information is a different means of looking at the past events that occurred in businesses, using evidence. The business executive makes decisions on past events, predictions, and prescriptions based analysis of past events.

Question is, Can businesses use these IS based evidence in place of paper-based evidence. Support for this usage comes from the "Electronic Transactions Act. No 19 of 2006". This act provides as follows "... laws for the time being in force in Sri Lanka attach legal validity to certain instruments, only if such instruments

have been reduced to writing, such requirement shall be deemed to be satisfied by a data message, electronic document, electronic record or other communication in electronic form if the information contained therein is accessible so as to be usable for subsequent reference". First evidence in such nature was accepted by apple courts a few years back, a photocopy of an SMS was accepted as evidence. However, I accept that this is a much-uncomplicated example of the subject under discussion. However, based on the premise we have built, IS stores evidence in electronic form, and such electronic form evidence fulfills the requirement of documents in front of the law. So, we have the first opening to use electronic evidence in businesses.

Let's go back to accountants and auditors. They say that they need paper-based evidence because that has been the practice and they have not seen an alternative to paper-based evidence. Accounting systems are standards declared by accounting bodies. A business may select an appropriate system based on the guiding principles declared by the accounting body. However, delegated authorities and documents/forms used within the systems are to be decided by the management of the firms. Appropriately, such systems should be approved by the board of directors or the entrepreneur. Once such approval is received, it becomes a valid artifact for the business. When the owners or agents of owners with appropriate authority approves a system, it becomes a valid system for the firm. Thus, the decision to us electronic evidence, if decided by the owners or agents with appropriate authority is decided, it will be valid for the firm. Thus, an initiative to start using electronic evidence starts at the policy level of the firm. Such philosophies and policies should be trickled down to practices using an appropriate mechanism like 6ps of HR.

Next question is, how the originality of evidence would are maintained. Such will be the responsibility of IS designers. At the time of designing IS, how the integrity of evidence/data is preserved should be appropriately designed/established. The integrity of data/evidence comes from the Information system Security profession, which is built on three pillars namely Availability, confidentiality, and Integrity. Integrity here is that data are not altered after capturing. Rather the data stored represents the actual event that occurred and any unauthorized alternations are prevented and is such occurs they can be traced. This feature should be established by strong design in IS.

Next question come, even with the integrity of data is established, and will people take personal accountability of such data. Most probably people will not. People need a better mechanism which gives the control to them personally if they need to be satisfied. The first level of such confidence can be provided with electronic signatures. There are many levels of electronic signatures used. However, we are not referring to the practice of pasting a scanned image of the signature on an image of a document as an electronic signature. Electronic signature we refer are the electronic signatures issued by certification authorities, backed by encryption and validation techniques of private-key, public-key encryption. As if today, Lanka clear provides such facilities to finance sector in Sri Lanka. My personal

experience in electronic signature comes from building a paperless business for my small business. I have been using a low-cost electronic signature when I send proposals to clients over email. We do not make printed copies. Even the Letterhead is electronically made and I sign electronically before transmitting. This electronic signature gives a mechanism to establish the integrity of the document. Next level of such authentication comes from digital credentials, like certificates and badges issued with public-key private-key encryptions.

Now the situation is, firms can adapt electronic evidence with assured integrity. People can be issues with electronic signatures to continue the practice of signing and personal confidence for the integrity of electronic documents. Next consideration is how you use these electronic documents in inquiries and in front of courts. Now the IS, IS security, and Legal professions should merge or work together. If we take the worst case scenario, when an electronic evidence is presented in courts, this merged profession should establish the integrity of the evidence in a manner the judge or the inquiry officer is appropriately satisfied. On the other hand, opposing lawyers should be capable of challenging such evidence and to be satisfied that they have the required integrity, this will help to enhance the sophistication of paperless practices among businesses. Firms should have internal competencies of how this is achieved, I have used a couple of cases using electronic evidence. In one case an employee saved the job due to proper use of electronic evidence and in another case, we had to establish storing of photographic material in company laptop, to an inquiry officer who was having a low know-how of IT knowledge. In another case, we had to break an alibi of an employee presented to an inquiry with digital evidence. With all these examples we have gathered the way how such procedure should be designed. However, I do not intend to discuss this in this article. If any reader is interested, you are welcome to contact in person.

Next is the unlimited opportunity of using evidence other than documents, with the help of IT. IT provides opportunities for using many other pieces of evidence such as audio, video, text, images and many others, which I do not go into details in this article. Using IT for the purpose of communication is already in practice with email and content management systems. Still, the systems to prove authenticity and presenting in front of authorities, judges and inquiry officers need to be re-thought.

The bottom line is that there is no better time than today for your business to go paperless. Your initiative to go paperless will contribute to two pillars of triple bottom line, Profit and Planet. You will be saving the plant by not giving those who cut down the forest, they use you doing business as a reason and you may reduce the cost by 10% to 20%, depending on the sector you are in. However, there may be initial investments, my experience is that you do not need to start by investing a huge amount. There are low-cost tools you can start with, as your practices are maturing you may consider going for sophisticated facilities to support your paperless practices.

SUSTAINABLE LEADERSHIP FOR BUSINESS TRANSFORMATION

By Eng. S.P. Kandanearachchi

Introduction:

Sustainable development is aimed at transforming the correlation between economic growth, the environment and society from negative to positive (World Bank 2012). This can be achieved when business organizations fully accept the challenges of sustainability as a business development opportunity and transform their business models. Leading companies are embarking on a transformational process with multi-stakeholders in their value chains and in doing so transform into sustainable business organizations.

Sustainability has become a business mega-trend that changes the demands placed on business leadership in various fundamental ways, thus creating the need for a new type of leadership-sustainable leadership (SL).

SL requires a redefinition of core concepts that underpin current mainstream business leadership practice. Foremost is the concept of creating value, which cannot be equated with mere profits or price. Profits are derived from shared value, which in turn is the result of a process of intentional collaboration and long-term interests with a collective purpose of stakeholders in a particular value chain. The features of SL can be divided into six categories of leadership attributes, which all start with a C-context, consciousness, continuity, connected, creative and collective-hence these are referred to as the 6C-model. This model will be compared with a number of other recent leadership models designed for sustainability.

The world's economic and political structures seem increasingly incapable of protecting our ecosystems, managing our resources or preventing rising social inequality. As a result, there is now a business imperative for rapid, non-linear change. Business leadership will need to take up the challenge of creating sustainable economic systems.

The economic theoretical paradigm is changing as below, as shown in the existing and new theoretical principles.

EXISTING	NEW
Supply and demand : The purpose of economics is to match material needs (demands) with material resources (supplies), which are scarce by nature	Economics belong to social science which has established that humans are driven by more than functional and rational needs; supply/demand laws do not apply to all facets of life
The theory of efficient markets: markets tend towards equilibrium	Markets are manifestations of social human behavior, so they are constantly developing and evolve over time.
The rational agent theory: people are rational and individualistic agents	People are more than rational and functional agents: they are also emotional, social and spiritual beings, with concordant needs.

Table 1: Economic theoretical paradigm

In short, in new economic theory it is no longer only important to know what we produce and consume; equally important is the understanding of the way we think and our awareness of the social context.

Given the central role of human thinking and interacting in the new economic paradigm, markets should be viewed as a community where stakeholders are engaged in a continuous interdependent process of dynamic co-creation of shared value fulfilling functional, rational, emotional and spiritual need, both short and long term.

Business Transformation towards Sustainability

The initial calls for sustainable development came from concerned environmentalists and visionary social and public leaders, such Carson (1962), Meadows et al. (1972) and WCED (1987), typically projecting a vision of sustainability as a desired utopian 'end point', while putting the business community on the defensive as they were perceived to be the major threat to this desired state of sustainability. In the years that followed, sustainability has been defined more as a change process in which business has gradually taken on a participatory role.

Paradigm shift has seen in Business Organization as a hierarchically structured machine whose sole purpose is to make profits, to one of a living network in which value is generated by human connectedness, creativity and sense of common purpose. Contributions to this shift came, amongst others, from Senge (1990) who introduced the field of organizational learning, De Geus (1997) with the notion of a 'living company', Collins & Porras (1997) who looked at firms that were 'built to last', and Sisodia et al. (2007) who defined companies who create profits by following purpose and passion as 'firms of endearment'. Companies that strive for sustainable performance are coming to the same conclusion: sustainability is a function of leadership that is empowered with mind-sets and abilities that allow them to embrace the complexity that the sustainability challenge demands and create value with multiple stakeholders (Senge, 2008; Porter & Kramer, 2011; Eccles, 2011; Doppelt, 2012).

Most businesses operate and check how can I use society and the environment to be successful? But now the trend is opposite-how can business contribute to the society and the environment to be successful? Business thinker Gary Hamel (Hamel and Breen 2007) goes one step further by specifically addressing the beliefs we hold in our minds:

"The biggest barrier towards the transformation of capitalism cannot be found within the observable realm of org charts, strategic plans and quarterly reports, but rather within the human mind itself ... The true enemy of our times is a matrix of deeply held beliefs about what business is actually for, whom it serves and how it creates value."

Sustainability thinkers agree that sustainable development requires a change in the way we think (Marshall et al. 2011). In the words of David Orr: 'The crisis we face is first and foremost one of mind, perceptions and values' (Orr 1992: 27).

New Mind-sets and skill sets:

The contextual changes on macro- and micro-levels imply that 'business leadership as usual' will not suffice in creating sustainable economic structures. In particular, best practices of HSOs indicates, the new leadership requires a shift in business thinking, mind-sets and awareness, hence an evolved type of consciousness, with an appropriate skill set derived from this consciousness. These observations correspond to findings by a recent study undertaken by researchers from Ashridge University and EABIS on the mind-set and skill set of the global leaders of tomorrow (Gitsham 2009). As per their research the future leader's mind-set recognizes the changing context with trends towards

increasing complexity and interdependence among stakeholders. In addition, this type of leadership employs a long-term view, a sense of continuity, while exhibiting open-mindedness, moral courage and a high degree of self-knowledge. We can summarise this mind-set as three Cs: context, consciousness and continuity.

With regard to the skill set that is associated with this mind-set, the Ashridge/ EABIS report refers to the ability of connectedness-the ability to understand the actors in the wider political landscape and to engage and build effective relationships with new kinds of external partners. Another particular skill set that is required is referred to as creativity; 91% stress the ability to find creative, innovative and original ways of solving problems, according to the Ashridge/EABIS report. Our review of HSOs' best practices points to the importance of applying this skill towards value creation by meeting the present and future needs of all stakeholders in the value chain. Finally, all these efforts should be designed from the perspective of scaling up so as to achieve collective sustainable impact. This includes the creation of measurement models that account for sustainable, shared value and embedding sustainability practices in business structures and systems. This can be framed as an ability to create collectiveness, complementing the abilities of connectedness and creativity.

Table 2: Elements of Sustainable Leadership

SL Elements	Concepts used in economics and business
Context	Recognizing interdependence; complexity; ambiguity; interconnectedness; resource constraint; regulators; mega-trends
Consciousness	Mind-sets; world-views; beliefs; mental models; attitudes
Continuity	Long-term horizon; courage; strength; common purpose; centredness; change processes
Connectedness	Serving needs of all stakeholders; both long and short term influencing; collaboration; trust; fairness; altruism; relatedness; needs instead of wants
Creativity	Innovation for sustainable shared value creation; sustainable business models; new value measurement models;
Collectiveness	Scale up for collective impact; embedding sustainability in business structures; sustainable consumption

In other words, SL implies the development of three new mind-sets and three new skill sets, each starting with a C. We call this the 6C Sustainable Leadership model and summaries the key new leadership elements in Table 2.

Recent leadership models directed towards sustainability

Marshall Roberts (2012)

According to Roberts, in order to be successful in the current context, transformational leaders typically exhibit the following five competences:

- Holistic thinking. They tend to see the 'whole' or big picture and avoid getting bogged down in siloed thinking
- Systems thinking. They see relationships between parts of the organization that others miss, fostering breakthrough innovation
- Humanistic thinking. They are able to sense the emotions of others and connect on a 'heart' level when dealing with groups and teams
- Social optimism. They can authentically envision today's big problems being solved, and use this vision to overcome cynicism
- Authentic filtering. They quickly discern others' motives and react appropriately in complex social situations

Peter Senge (2008)

Senge, in his book The Necessary Revolution: Working Together to Create a Sustainable World, presents a new mind map that today's leaders must embrace. It has three core elements:

- Systems thinking. Yesterday's leaders thought in terms of parts and boxes. Today's leaders must be systems thinkers able to see the big picture relationships between parts of a system, and how these parts combine to create the emergent properties of the whole
- Collaboration - across boundaries. Yesterday's leaders embraced zero-sum thinking within the context of a scarcity-oriented, competitive framework. Today's leaders must be able to think from a larger, more expansive 'thrive and help thrive' mind-set, which allows them to collaborate across conventional business and social boundaries.
- Adaptivity - through creating and adjusting. Yesterday's leaders focused on linear problem-solving and disciplined execution of detailed plans. Today's leaders must have a more creative orientation in which they re-contextualize old problems, allowing the inherent structural tension between their future vision and current reality to pull important goals into fruition

According to Senge, who defines leadership as 'how we shape futures that we truly desire', these three parts work together to create an effective and self-reinforcing leadership paradigm for top learning organizations of tomorrow.

Goleman and Lueneberger (2009)

Goleman and Lueneberger have looked at how leadership within companies that are engaged in sustainability initiatives manifests and evolves. They found that sustainability initiatives could not be driven through an organization the way other changes can. They have three distinct stages, and each requires different organizational capabilities and leadership competences.

- **Phase 1 :** making the case for change. When an organization is largely unprepared to address sustainability, the key challenge is to make a clear and compelling case for change. Because the organisation is at best reactive to the challenges of sustainability (and usually unaware of the opportunities), the sustainability leader must be adept at collaborating and influencing others in the course of the transition from unconscious to conscious reactivity. At the end of Phase 1, sustainability emerges as a powerful mandate that is pervasive throughout the organisation.

- **Phase 2 :** translating vision into action. When companies emerge from Phase 1, commercial orientation becomes the key competence in aligning sustainability initiatives and value creation, a point that cannot be emphasized strongly enough. Now the task is to translate high-level commitments into a comprehensive change programme with clearly defined initiatives and hard commercial targets. To make this happen, sustainability leaders in Phase 2 must excel at delivering results, and they must have a strong commercial awareness. At the end of this phase, the organisation is consciously proactive on sustainability across its footprint and tracks economic, environmental and social metrics over the business planning cycle

- **Phase 3 :** expanding boundaries. The need for commercial orientation continues unabated but is now matched by a strong strategic orientation. As the organization continuously raises the bar and leverages sustainability to create competitive advantage, it increasingly views sustainability as a strategic opportunity and gauges its progress

with metrics that reach beyond the short and medium term. As such, the sustainability leader must be adept at anticipating and evaluating long-term sustainability trends, spotting new opportunities and developing strategies to reposition the organisation to benefit from them. The goal is to embed sustainability in the organisation's

DNA, much like quality or financial control, such that it is a core value and the organisation is unconsciously proactive about it

In short, sustainability leaders have the following six competences:

- Collaborating
- Influencing
- Delivering results
- Commercial awareness
- Anticipating long-term trends
- Evaluating long-term trends

Conclusion:

In essence, success in sustainable business transformation rests on the interplay between leadership consciousness and contextual awareness, in both space and time. Therefore, among the 6Cs of sustainable leadership the mindset of context, conscious and continuity are the main drivers of sustainable leadership. Combined with the skills of connected and creative leadership, they enable the emergence of collective leadership necessary for sustainable value chain transformation and large-scale social sustainable impact. SL recognises the relationship between context, consciousness and continuity as the fundament for sustainable leadership transformation and thus provides a new context and purpose for the connected, creative and collective leadership abilities.

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RECOGNITION OF INTELLECTUAL PROPERTY RIGHTS UNDER DIGITALIZATION

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Introduction

It is a fact scientifically proved that only the man can do intellectual Creation and Invention. Any civilised society will recognise that power and provide legal protection such as `intellectual property rights' of the creator or inventor. Development of Intellectual Property Law plays a vital role to protect rights of authors, inventors, owners, who are involved in Intellectual Property. Further, it encourages the man to create, invent or produce new to the world.

Copyright, Patent right, design right, rights of trade mark, trade name and unfair trade practices including trade secrets are the key IP rights identified under such law. Countries have accepted TRIPS agreement, Berne Convention, WIPO Convention, Washington Treaty and have enacted their own Intellectual Property Laws recognising the said rights subject to certain variations relevant to their own jurisdictions. As a result, currently, the Act No.36 of 2003 governs the law relating to such rights in Sri Lanka. Even prior to the present Act, this law had been in operation in the country under various Acts, the Merchandise Marks Ordinance No.13 of 1888, the Designs Ordinance No.7 of 1904, the Patents Ordinance No.15 of 1906, the Copyright Act 1911 of the United Kingdom which continues to apply to Ceylon, the Copyright ordinance No 20 of 1912, the Trade Marks Ordinance No 15 of 1925, the Patents, Designs No 32 of 1942, Copyright and Trademarks Ordinance Act No.34 of 1949 and Code of Intellectual Property Rights of 1979.

Innovative Digitization

There is a sudden growth shown in the Information and Communication Technology industry during the last few decades. In the meantime, increment of new issues and disputes in relation to the ICT industry are also no second to the growth of the industry. Under these circumstances, the international community has realised the value of protection of Intellectual Property Rights of Computer program and other ICT related matters. As a result, countries in the world are gradually entering into

various international Conventions and treaties dealing with these new issues under digitalization.

All these international treaties or agreements express clear acceptance to provide due protection for the inventors and authors of original works involved in the fields of Information and Communication Technology. In the meantime, it is clear that different jurisdictions have adopted various legal definitions identifying such rights considering legal systems.

Legal Position in Sri Lanka

The legislature in Sri Lanka has introduced Intellectual Property Act No.36 of 2003 including areas relevant to Information and Communication Technology industry fulfilling the country obligations under the international treaties and agreements. Recent judgement of the Supreme Court, ***in The Swedeshi Industrial Works Ltd Vs Director of Intellectual Property***[1] ***that the*** Intellectual Property Act recognises and provides for and protects Copyright, Industrial Designs, Patents, Trade Marks, Trade Names and Layout Designs of Integrated Circuits and also provides protection against Unfair Competition and misuse of Geographical Indications."

It is clear that the Act recognises issues related to the said rights like their exemptions, limitations, procedures on registration and remedies upon infringement of such rights and so on.

Patent Right

Dictionary meaning of `innovation' means new ideas or methods or newness including modernisation. However, as far as the Intellectual Property Law is concerned, only invention with novelty, inventive step and industrial application but not mere ideas, methods, procedures or systems will get legal protection of Patent Rights.

Part IV of the Intellectual Property Act No.36 of 2003 deals with Patent rights and Chapter XI defines about `Patent'. Section 62 defines "invention" as an idea of an inventor which permits in practice about the solution to a specific problem in the field of technology. Invention may be, or may relate to, a product or process.

As far as digitalization is concerned, in UK Patent Act 1977 program for a computer has been excluded from definition of inventions. See Fujitsu Ltd's Application[2]. Computer programs were rejected considering they merely implemeonted mathematical methods. See section 62(3)(a) of the Intellectual Property Act in Sri Lanka, Section 1(2) of Patents Act in U.K., Article 52(2) of European Patent Convention.

The issue whether the claimed invention when viewed as a whole exhibit a technical

01. C.H.C. Case No. 36/2002/3, Decided on 18th January 2018
02. (1996) RPC 511

effect, or merely falls within the excluded matter defined in section 1(2) of the Patent Act in the U.K. was considered in the case In re Merill Lynch[3]. It was decided that any software related innovation performing a function could be carried out within the human brain (even though the function would not reflect the normal process of human reasoning) would not be patentable. See Wang[4], Raytheon[5] and Fujitsu Ltd's application[6]. In Australia Federal Court has decided that a computer programme producing an improved curve image that if the invention produces a commercially useful effect such invention would be patentable. See International Business Machines Corporation vs. Commissioner of Patents.

The European Patent office considers technical effect when deciding on the patentability of an invention. In Vicom[7] patent granted for Computer related invention enhancing of digitised images and decided that there was a technical effect in it. Technical Board of Appeal held that the requirement was that the mathematical method should be applied within a specific technical context, which, being capable of industrial application would qualify for patent protection.

When there is no technical effect and there is only a scheme for performing a mental act a computer program would not be patentable. See Merrill Lynch, Pension Benefits System (T931/95 TBA) in US. See Software Patents after Fujitsu by Prof.Ian Lloyd for complete analysis on the said issue. On the other hand, in a country like Japan, patent right may be available for software without making much effort.

The position under Intellectual Property Act No.26 of 2003 in Sri Lanka is that there is no exclusion of programs for computers from patent rights. Intellectual Property rights involved in ICT industry especially, relevant to computer programs operate as a global phenomenon and do not limit to a country or region. Online contracts and software industry will not be restricted to any particular geographical area and as a result, cross border issues are always involved in it. However, major problem arises with Patenting of inventions in ICT industry since patent protection provides upon its registration with relevant national authorities even though its effect and operation is international.

Registration of patent rights is mandatory and procedure of registration and dispute resolution mechanism upon infringement of such rights are clear under any legal system. Requirements of Application and procedure relevant to grant Patent of the country are specified under Chapter XIII of the Act. Other common areas relevant to

03. (1989) RPC 561
04. (1991) RPC 463
05. (1993) RPC 427
06. ibid
07. 1987 2 EPOR 74

patent such as duration of Patent (chapter XIV), Rights of owner of Patent (Chapter XV), Assignment, and Transmission of Patent Applications (Chapter XVI) License Contract (Chapter XVII), Surrender, and Nullity of Patent (Chapter XVIII) are specified in the Part IV of the Intellectual Property Act.

As far as the patent right protection in Sri Lanka is concerned, most of the other countries also have adopted almost similar laws identifying and managing the same.

In Dr. K. Abeyratne, Centre for Policy Alternatives (Guarantee) Ltd and Nihal Fernando are Petitioners reported in (2003) Bar Association Law Reports , the Supreme Court has examined the constitutionality of Clauses 62, 83, 84, 90, 91, 92, 93 and 94 of the bill of the present Intellectual Property Act of the country. (See also Parliament debate upon amendments brought by the legislature of our country after the said Supreme Court decision).

Trade Marks and Trade Names

Applicability of provisions under this Act for Trade Marks and Trade Names for Computer hardware has no distinction from applicability of the same for other goods or services. The rights of a registered owner of a Trade Mark are exclusive but not absolute. On the other hand, the IP Act of 2003 does not define or even refer to the term "brand name". See the judgement in aforesaid case, The Swedeshi Industrial Works Ltd Vs Director of Intellectual Property. Definition of `certified mark', `collective mark', `enterprise', `false trade description' and so on are provided in section 101 of the Intellectual Property Act.

Admissibility of Marks is explained in section 102 and 103 of the Act and the Director-General will not register a mark likely to mislead the public under section 104 of the Act. See James Finley vs. Stassen Exports Ltd .

Infringement of Trade Marks and Trade Names in Cyberspace.

Domain Names will function as a trade or service mark within the definition of the Act. Internet users can be misled by functions of similar domain names with hyphen, space etc., in between genuine domain name. As far as the section 121 of the Act is concerned, the provisions of the same can be applied for trademarks in Cyberspace as well.

Author of the software introduces Meta Tags when he writes the code for a page. Operator will use Meta tags to control the indexing of the website by the search engine. Meta Tags may be a trademark. ***See Playboy Enterprises Pvt vs.Calvin Designer Laber .***

Purpose of Uniform Domain Name Dispute Resolution Policy (approved on

24.10.1999) is explained as "policies have been adopted by the Internet Corporation for Assigned Names and Numbers (ICANN), is incorporated by reference into ones Registration Agreement, and sets forth the terms and conditions in connection with a dispute between such person and any party other than the registrar over the registration and use of an Internet domain name registered by him".

Upon applying to register a domain name or renewal of such name applicant represent and warrant to the registrar that the statement made are completed and accurate, such name will not infringe upon or otherwise violate the rights of any third party, the applicant is not registering the domain name for an unlawful purpose and such name will not be used by the applicant in violation of any applicable laws or regulations, knowingly.

However, Domain Name Registry is not obliged to investigate whether a domain name applied would infringe rights of a third party. Domain Name Registry would only ask for a letter from the organisation requesting the domain to confirm that they have a right to the name. However, this can be a challenge. There are some dispute resolution mechanisms available relevant to domain names disputes. Eg.ICANN, WIPO.

Requirements of Application and procedure for Registration of a mark specified under Chapter XXI of the Act. Duration of Registration of Marks (chapter XXII), Rights of the Registered owner of a Mark (Chapter XXIII), Assignment and Transmission of Applications and Registration of Marks (Chapter XXIV) License Contract (Chapter XXV), Renunciation and Nullity of Registration of a Mark (Chapter XXVI), Removal of Mark (Chapter XXVII), Collective Marks (Chapter XXVIII), Certification Marks (Chapter XXIX) and Trade Names (Chapter XXX) are specified in the same Part V of the Intellectual Property Act in Sri Lanka.

Section 121 of the Act explains that the registered owner of a mark shall have exclusive rights in relation to the mark to use such mark, to assign or transmit the registration of the mark and to conclude license contracts. Unauthorised use of the mark misleading the public explained in the same section is an offence under this Act.

Layout Designs Rights of Integrated Circuits.

Part VII of the Intellectual Property Act No.36 of 2003 in Sri Lanka defines Layout Designs of Integrated Circuits, right to protection etc. Section 146 of the Act defines the protection of such right and according to section 147, it requires `originality' of layout design to get such protection it shall belong to the creator or creators jointly. Interpretation of `Integrated circuits' provides under section 159 of the Act as `a product, in its final form of an intermediated form, in which the

elements, at least one of which is an active element, and some or all of the interconnections are integrally formed in or on a piece of material and which is intended to perform an electronic function.' Further, same section defines `layout design' and further states that layout design is synonymous with topography.

Design Right (Semiconductor Topographies) Regulations 1989 in the United Kingdom brought chip designs (patterns or arrangement for patterns) within design right.

The right belongs to the employer or the person who commissioned the work, as the case may be. However, such creator would be entitled for such protection if only such layout is original. Original means that it neither has been produced by the mere reproduction of another layout design nor of any substantial part thereof. Further, it shall be the result of an intellectual effort of a creator and cannot be commonplace among creators or layout designs and manufacturers of integrated circuits at the time of the creation of such layout design. If a layout design consists of a combination of elements and interconnections that are commonplace among creators of layout designs or manufacturers of integrated circuits, the same shall be protected only if the combination, taken as a whole, meets the conditions aforesaid.

Scope of protection

This is defined under section 148(1) of the Act and such protection shall not extend to the matters explained under section 148(2) of the same Act. E.g., reproduction for the purpose of evaluation, analysis, research or non-profit teaching, education or matters explained regarding incorporated integrated circuit of a layout design under the same sub section. Protection will be not available under the same Part of the Act for any layout design, which has been commercially exploited in or outside Sri Lanka for more than two years prior to the commencement of the Act. Commencement and Duration of the right are explained under section 149 of the Act. Registration of layout design is explained in section 151 and requirements of the Application are explained in section 150 of the same Act. Section 152 explains right to transfer and rectification of the Register and section 153 provides provisions for changes in the ownership and contractual licenses. Cancellation of a Registration of a layout design is explained in section 154 of the Act. Further, infringement of the performance of any act contravenes to section 148 and injunctions as remedial issues explained according to section 156 of the Act.

Copyright

"Copyright is the mechanism for establishing ownership and it is increasingly seen as the key to wealth in the Information Age." - Charles C.Maan. After realising, the importance of the same,

international community has shown their willingness to abide by policies and rules voluntarily. Accordingly, countries have introduced required legislation to their own countries fulfilling their international obligation activating their treaties or agreements. These developments are commendable and encourage intellectual creators and inventors who are involved in the ICT industry.

According to Article 10 of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement `Computer programmes, both in source code or object code, are protected as literary work under the Berne Convention (1971). Further, Compilation of data or other material, whether in machine-readable or other form, according to the selection and arrangement of such contents by the author constitute intellectual creation and it will be protected by copyright. However, such protection cannot be extended to individual data or material itself, shall be without prejudice to any copyright subsisting in the data or material itself.'

Article 36 of TRIPS Agreement provides protection for integrated circuits, semiconductor chips in accordance with Washington Treaty 1989.

Preamble of the World Intellectual Property Organisation (WIPO) Copyright Treaty expresses some intentions of the Contracting Parties as to provide adequate solutions to the questions raised by new economic, social, cultural and technological developments, recognising the profound impact of the development and convergence of information and communication technologies on the creation. Under Article 4 of the same, parties have agreed to protect Computer Programmes as literary work within the meaning of Article 2 of the Berne Convention. Article 11 explains obligations concerning Technological Measures. Agreed statements of the same treaty express the desire of the agreed parties to extend Copyright protection to work in digital form in an electronic medium.

The European Union adopted a Directive on the Legal Protection of Database to deal with the structure of the databases giving sui generis right (Right of special nature) for the same. In the United Kingdom, Copyright, Designs, and Patent Act 1988, (CDPA) has identified the said Intellectual Property rights and under the same Act, computer programme must be `original' and `recorded' for copyright.

The European Parliament has introduced number of Directives such as Software Directive (1991), 2000/31/EC (Directive on Electronic Commerce), 2001/29/EC (Directive on the harmonisation of certain aspects of copyright and related rights in the information society) and Article 10 of Convention on Cyber-crime. (Budapest) identifying Intellectual property Rights relevant to computer programs.

In the United States, Code Title 15c. 22

Trade Marks, Code Title 17 Copyrights, Section 2319 of Code Title 18 Crimes and Criminal Procedure and Code Title 35 Patents are some of the legislation introduced to protect Intellectual Property rights for computer programs. See Apple Computer vs. Franklin Computer Corporation and Computer Associates vs. Altai to identify the position regarding non-literal copying of computer program in US.

Section 2(ffc) of the Indian Copyright Act 1957 as amended in 1999 identifies copyright for Computer Programmes. Further, provisions under Copyright Act 1968 in Australia and Australian Broadcasting Services Act 1992 explain Intellectual Property rights relevant to computer programs.

Copyright of Computer Programs.

Present Intellectual Property Act No.36 of 2006 in Sri Lanka covers `original intellectual creations in literary, artistic, and `scientific domain' under copyright. Any work to be protected as literary, artistic, or scientific domain, Intellectual Property Act in Sri Lanka requires them to be original Intellectual creation. In Wijesinghe Mahanamahewa and another vs. Austin Canter , it was held that whether a re-production is substantial shall be decided by its quality rather than its quantity and the reproduction of a part, which by itself has no originality, will not be a substantial part of the copyright and therefore will not be protected.

Computer programs are protected works by copyright as literary, artistic, or scientific domain under Section 6(1) of the Intellectual Property Act. Computer program is the result of modest amount of skill, labour, or judgement. However, spending of money for labour for creation is not solely enough to obtain copyright (see Feist Publications Inc vs.Rural Telephone Service Co. Inc) and it shall originate from the author. See the judgement in University of London Press Ltd.vs.University Tutorial press Ltd . Courts expect creative achievement exceeding the average skills used in the development of computer programmes for consideration of copyright. See analysis in Sudwestdeutsche Inkasse KG vs.Bappert und Burker Computer GmbH .

There are two types of codes involved in Computer Programmes. They are source code and object code. Source code is defined as a version of a programme, using alphanumeric symbols. Computers cannot process the source code directly without translating the same into a machine-readable form (object code) after compiling with a particular computer language compiler. Object code comprises long series of ones and zeroes (on and off switch mode) instructions to process data. See page 40 of Computer Law (Chris Reed) and Sega Enterprises Ltd. Vs.Richardsand Apple Computer Inc vs.Computer Edge Pvt Ltd.

"Computer" and "Computer Program" are defined in Section 5 of the same Act for the

first time under Intellectual Property Law in Sri Lanka. Accordingly, `Computer' means an electronic or similar device having information processing capabilities; `Computer program' is a set of instructions expressed in words, codes, schemes or in any other form, which is capable, when incorporated in a medium that the computer can read, of causing a computer to perform or achieve a particular task of result. However, this interpretation can bring unnecessary disputes in future.

Copyright for Databases

Collection of works and collection of mere data (databases) also be protected as Derivative works under Section 7(1) (b) of the Act, whether they are in machine readable, or other form, provided that such collections are original by reason of the selection, co-ordination, or arrangement of their contents.

In Macmillan & Co.Ltd vs.K & J Cooper it was decided that the final effect of a compilation might be original even though many compilations have nothing original in their parts. On the other hand, linking several programs together also cannot be considered as original compilation. See Information Processing Systems Ltd vs.Daman Ltd .

Infringement of Copyright

To gain access to a website the web user has to enter the web address through a browser (program to view of a formatted web document) and that brings up the page requested and display on the screen.

Whenever a user opens a web page, his computer will operate by temporarily storing (temporary copying) the contents of that page in its Random-Access Memory (RAM) automatically (facilitate browsing) to display the page on the screen. Even such temporary copy erases at switching off the computer, if this is an unauthorised copying, it may be an infringement of author's exclusive right explained under copyright and other rights relating to unfair competition and undisclosed information or be covered under implied license since a RAM copy would amount to a copy under the meaning of the same Act. Downloading of licensed images from the Internet, clip-art provided with Software e.g. front pages of Adobe, Microsoft etc., and free images of the Internet will not be a violation of copyright. Taking images from a third party and creating a new image may be a violation of copyright.

Further, at the time of browsing of such webpage, it is displayed on the computer screen without authorisation of the owner of copyright and it would amount to an act of communication to the public under section 9(1)(k) read with section 5 of the Act and violation of his economic rights guaranteed under copyright of the same Act.

Same violation would cause during Caching. Caching is a high-speed process of storage mechanism in the user's

computer and on servers (peripherals) when the user surf web. From this Caching memory, browser can retrieve the visited web pages quickly without fetching the same from the original website. When the user regularly visits some particular websites, this is very useful to the browser preventing unnecessary traffic and reducing the waste of time and money. Like in browsing, storing of contents of web pages in caching may be unauthorised copying and an infringement of author's exclusive right under the meaning of the Act.

In John Richardson Computers Ltd vs. Flanders , the issue to decide was whether substantial part has been copied or not. In Ibcos Computers Ltd v Barclays Mercantile Highland Finance Ltd matter brought before courts to decide whether the defendant who had written particular software for the owner of the same has sold competing software to another party violating an agreement he had with the owner not to sell such software for duration of two years.

Jacob J stated (at 289) `logically therefore the claim in copyright calls to be tested in the following order; (a) What are the work or works in which the plaintiff claims copyright? (b) Is each such work `original'? (c) Was there copying from the work? (d) If there was copying, has a substantial part of that work been reproduced?'

Rights under copyright

Owner of copyright has the exclusive Economic rights specified under section 9 of the Act. The author of a work has Moral Rights defined in the provisions under section 10 (a)-(c) of the Act independent to his economic rights even where he is no longer the owner of such economic rights. It was decided In Ariyawathie Senadheera & Dilani Senadheera Vs Shantha Senadheera & Amal Randeniya, that, if the plaintiffs wished to obtain declarations prayed for in prayer of the plaint, under sec 9 of the intellectual Property Act they were obliged, at the very least, to frame a specific issue on whether the defendant had violated section 9 (1) of the same Act.

Exceptions to copyright

Computer software includes many items like manuals electronically or otherwise, electro-magnetic tapes, Compact discs required for operation of the computer. Such manuals or printouts may be literary work under section 6(1) of the Act. However, algorithms frequently used in computer programming are not capable of copyright protection since it will be interpreted as `idea of algorithms' under section 8(a) of the Act.

Economic Rights expressed in Section 9(1) will not apply for `fair use' of a work. See the judgement in Lalitha Sarachchandra vs.Upul Shantha Sannasgala . Act of fair use defines in section 12 of the Act. Accordingly, the private reproduction of a published work in a single copy shall be permitted without the authorisation of the

owner of the copyright, where the reproduction is made by a physical person from a lawful copy of such work exclusively for his own personal purposes. This permission has not been extended to the reproduction of the whole or a substantial part of a data base of a computer program according to section 12(2) of the Act except in case the reproduction would conflict with a normal exploitation of the work or would otherwise unreasonably prejudice the legitimate interests of the owner of the copyright unless as provided in subsection 12(7) of the Act. Eg. a copy of a legitimate computer program can be made as a backup copy if the original copy is lost considering the purpose of using such program. However, such backup copy cannot be used for some other purpose.

Duration of copyright is specified in section 13 of the Act and the ownership of economic rights explained in section 14 of the same Act. Presumption of authorship, in absence of contrary and assignment of license of author's rights are explained in section 15 and section 16 of the Act, respectively.

Remedy for violation of copyright

Any person who infringes or is about to infringe any rights protected (aforesaid) may be prohibited by way of injunction and be liable to damages under Section 22(1) of the Act.

Section 22(2) of the Act explains the jurisdiction of the Court. Further, a person aggrieved by infringement or affected in any other manner of any of his rights (aforesaid) may apply to the Director-General of Intellectual Property of Sri Lanka for determination and such decision shall be binding on the parties subject to making an appeal to the Court by any aggrieved party from the same determination.

Unfair Trade Practices and undisclosed information.

Section 160 (1)(a) of the Act states that any act or practice carried out or engaged in, in the course of industrial or commercial activities, that is contrary to honest practices shall constitute an act of unfair competition. This section provides a broad view for the subject matter and number of decided cases has established legal principles applicable under the same section. Similar provisions were under section 142 of the earlier Code of Intellectual Property Act No.52 of 1979 in Sri Lanka.

Linking of web pages happen when the user surfing on the webpage and by clicking it will link with another location on the website or a location on another website having similar data / connection automatically. Hyper Linking allows one website to link with another webpage and to provide access for the same. A party surfing on the particular webpage allows information to be hyperlinked or

hypertext reference linked within the same website or different websites. When the user logs into creator's website, the user's browser retrieves the data from copyright owner's Uniform Recourse Locator that commonly has known a URL, which points to the location in the browser. There are two types of linking. They are surface-linking and deep linking. Surface-linking links home (main) page of one website with home page of another website. Under deep linking, browser will direct to an internal part of a certain webpage bypassing the home page of the web user, avoiding information of the Home page and advertisements of the web site and so on. As a result, the subsequent web will lose advertisers who contribute to develop the same site, avoid opportunities to obtain consent to disclaim from the web user and finally quality of the same website would be endangered. This may be a violation of Intellectual Property Rights relating to `unfair competition' and `undisclosed information' of the victim under section 160 of the Intellectual Property Act. See Ticketmaster Corp. vs. Microsoft .

When a user visit website that website fetches content from another into a window and the same content appears on the original website. This is called `framing'. User may be confused about the website he logs into first and might not find out the details on different websites especially, by framing. In this event, URL, which direct to current location remains the same. Netscape introduced this in version 2. In Framing object code of the original web page will be reproduced and add to create the new frame, and if the author of website did not create or permit to create such frames it may be unauthorised copying and caused unfair competition and undisclosed information, an infringement of copyright, rights relating to unfair competition and undisclosed information.

During transmitting materials on the web, the server reproduces materials in the file sharing system. Considering the provisions under the Act this may be an unauthorised copy. There are no provisions relating to liability of service providers in Sri Lankan copyright law unlike in some other jurisdictions. Further, it could argue that even though the service provider would not be liable for direct infringement of copyright, he would be liable for indirect infringement, if he knew or should have known that he facilitated the infringement of copyright materials.

If downloading of contents to internet temporary files, caching, deep linking, framing, and file sharing will not be offences, if the same activities took place legitimately under section 12(7) of the Act. Otherwise, violator infringes copyright secured under the Act. Internet allows Linking and framing under normal circumstances unless prohibited expressly.

It is not easy to prevent users from downloading and copying creators' web pages and contents by a person browsing the web pages. Author or owner is well aware about this matter considering the nature of technicalities and mechanism of downloading web pages. Person may be not liable for copyright violation or other violations of rights like unfair competition and undisclosed information if there is no indication on the website itself that the same contents are protected under copyright or clear warning expressing effect of prohibition against unauthorised downloading. Otherwise, creator of the webpage can insert a special software preventing linking or framing illegitimately.

Spamming, Junk mail, Mouse Trapping, Sniffing and Cookies, Phishing are violations of rights relating to undisclosed information under the Act as well as an offence under section 4 of the Computer Crime Act in Sri Lanka.

Criminal offences involved in Intellectual Property Rights.

Most of violations under IP rights in ICT industry take place as international criminal offences. Even International Criminal Court accepts matters when States refer it to the Court or if local Courts fail to adjudicate the matter. When there is a violation of Intellectual Property rights, Codes of IP Law in most of the countries have treated same as local criminal offences in addition to other civil rights. The criminal liability under the Intellectual Property Act No.36 of 2003

We can consider preamble of the Convention on Cyber-crime (Budapest) as model provisions to establish and maintain international co-corporation to handle cyber-crimes in the world and the Articles in the same provide the measures to be taken at the National level to fulfil the task.

Article 45 of the same convention states that the European Committee on Crime Problems (CDPC) shall be kept informed regarding the interpretation and application of this convention and in case of a dispute between parties as to the interpretation or application of this convention, they shall seek a settlement of the dispute through negotiation or any other peaceful means or their choice, including submission of the dispute to the CDPC, to an Arbitral Tribunal (binding upon the parties) or to the International Court of Justice as agreed by the parties. Most of violations under IP rights in ICT industry take place as international criminal offences.

In Conclusion

Sri Lanka may address IPR violation under digilization with academic evaluation only and it is high time to strengthen the new branch of law bringing amendments to Intellectual Property Act, Electronic Transactions Act and Cyber Crime Act of the country introducing new interpretations, definitions, and explanations dealing with Intellectual Property rights security in cyber space successfully.

GOVERNMENT POLICY REFORMS IMPERATIVE TO DEVELOP THE STOCK MARKET

By Ravi Abeysuriya, CFA

Sri Lanka stock market is facing two major challenges; they are smaller size and lower liquidity. Solving this "size and liquidity" problem is imperative to unlock the potential of the stock market and requires very bold and visionary supply and demand side reforms by the Government. On the supply side, public enterprise reforms and listing of key commercial public-enterprises are necessary to increase the size of the stock market. On the demand side, pension reforms and facilitating digital transactions with a digital ID is required to generate sustainable demand for investing and trading and enhance market liquidity.

How the country will benefit from public enterprise reforms and listing of key commercial public-enterprises?

The Government has significant ownership interests in some of the most important economic entities in the country including banking, insurance, savings, home mortgages, energy, aviation, pharmaceuticals, and plantations, among others. Significant and multiple benefits can be obtained for all stakeholders as well as Sri Lanka's capital Market by listing of viable State Owned Enterprises (SOE's) in the Colombo Stock Exchange (CSE).

a) Once these are listed this would increase the CSE market capitalization. International fund managers usually measure the total market capitalization of a country as a % of its GDP as well as the absolute USD value. Sri Lanka remains stagnant due to size constraints as we have not been increasing the market capitalization of the CSE which is at 23% (India 95%, Vietnam 74%). Listing of SOE's would be beneficial as this would allow greater recognition for Sri Lanka as a frontier/emerging capital market.

b) Whatever the regime is in power, SOEs have continued to incur enormous and persistent losses and the citizens unknowingly pay for these losses by way of taxes. A majority of citizens having seen so-called privatizations of some SOEs done in the wrong way (given them to political henchman at highly undervalued prices and having lost jobs) are generally against privatization. The need of the hour is to stem the bleeding in SOEs and bring in private sector governance and management practices to SOE whilst continuing state ownership. Even profit making SOEs could improve their performance substantially if the governance issues in SOEs are addressed. Listed entities are mandatory required to follow governance standards such as, establishing a proper nomination process for the appointment and screening who is appointed as chairpersons and board of directors of SOEs, having professional management, financial discipline, performance monitoring and progress review of key performance indicators (KPIs), effective internal controls, risk management, among others.

c) Additionally, it would be a requirement for regular filing of financial accounts in a timely manner for these SOE's under the stringent listing rules and reporting requirements of the stock exchange. Thus, the public will get to know if and when political theft happen and when politicians use SOEs as a means to solve unemployment problems through 'sponsored employment'. Further, auditing of financial statements would have to be done without delays and more accountability will be created for these entities.

d) Employees of SOE's will also benefit generously from Employee Share Option Scheme (ESOP) that can be offered to get the employee buy-in and commitment for better performance of SOEs.

e) Well-run state-owned enterprises (SOEs) will be able to borrow funds through the issuance of securities in the capital market thus reducing their reliance on the Government for financing needs. Listed SOEs will then be able to raise more funds by way of both additional equity and debt offerings to the public and further reduce the budgetary burden of the Government.

Pension reforms

Government should consider pension reforms as vital to the development of the country. The long-term growth of capital markets of Sri Lanka will critically depend on demand side reforms in order to generate local demand for securities. When investment funds are allocated by the government political influence replaces returns as the basis for allocating the funds. As a result, investment projects that reduce national wealth rather than enhance becomes the reality as Sri Lanka has amply demonstrated by political boondoggles and high visibility projects favored by politicians. Pension reforms play a critical role in channeling retirement savings into long-term wealth-creating projects, where the entire economy will significantly benefit with increase capital productivity and higher income in the long term.

In Sri Lanka, the two mandatory and state-managed superannuation funds dominate the pensions industry. For example, the Employees' Provident Fund (EPF) investment portfolio consisted 91.3% government securities, 4.2% stocks, 2.1% corporate debentures and the remaining 2.4% in fixed deposits as at end 2017. The problem with EPF is that it has provided a low return i.e. an average of 11.5% per annum for the period 1980 to 2017 to members. When compared with the average Treasury bill yield, which is the short-term risk-free benchmark and the average annual inflation per annum of 10.4 % for the same period, the real rate of return from EPF of 1.1% (11.5% less 10.4%) over the period, is quite small.

Therefore, the monthly saving of 23% of the salary over the working life of the contributors will not grow to an adequate sum where the final withdrawal amount would be enough for a comfortable retirement. The returns paid to contributors is also low compared to the risk of investment portfolios. The funds did not pay a risk premium to contributors beyond the short-term risk-free rate although the portfolios of investments consisted of assets such as Treasury bonds,

corporate bonds and equities that are long term and are more risky than short-term Treasury bills. Therefore, it is important to consider creating more broadly diversified portfolios subject to the investment constraints to optimize the risk-reward structure of these portfolios.

The private sector provident fund schemes with one-size fits all approach, do not provide investment options with different risk-reward structures to their subscribers. All investment decisions are taken by the funds. The lack of choice inhibits the creation of portfolios with varying degrees of asset allocation across different asset classes to suit subscriber preferences.

A key aspect of pension reforms should involve offering portfolio choices to subscribers and creation of investment portfolios based on subscriber choices. Alternative risk-reward structures that match investment risk and return preferences of contributors will contribute to more activity in the secondary market as well. Subscribers can be offered three portfolio choices such as a Gilt Fund (Treasury bills and bonds), a Corporate Debt Fund (Corporate Bonds) and a Growth Fund (equity) whose returns are benchmarked against indexes. The subscribers will have the choice to decide what percentage of their monthly contribution goes into which fund rather than mandated by the Government. This approach will also yield greater long-term benefits as the subscribers will become more educated about investment choices over time, contributing to the development of a more knowledgeable and educated investor base.

Considering the excesses both in equity and bond investments that have transpired it is imperative that the management of provident funds in Sri Lanka are free from political interference and investments made by the funds are fully transparent to the contributors. The funds should be managed by professionals with skill, competence and diligence and are committed to their fiduciary duty and place contributors interest before their own. They should be well paid and be supervised by an independent oversight committee to ensure proper procedures and policies are followed when making investments to prevent them being enticed by bribes and corrupt practices resorted to by unscrupulous companies to amass large profits as was done in the past.

It is therefore imperative that the Government strengthen the technical capacity, knowledge and competency of in-house fund management of the statutory contractual savings institutions. The capacity building needs may involve establishing investment policy frameworks and policies, portfolio management expertise, risk management and infrastructure and ICT systems for fund management operations.

Digital Transactions with Digital ID

A well-developed and competitive capital market with financial inclusion is a must, if Sri Lanka is to emerge as a strong knowledge based economy. Sri Lanka's mobile penetration has reached 130 percent while data connectivity has reached 50 percent. Mobility has had a big role to play in the fintech revolution. The penetration of smartphones will provide unserved or under-served consumers a way to interact with financial institutions

and gain real-time views into their Unit Trusts/stock trading. Inevitably, as mobile apps grow in sophistication, so will customer demand for intuitive unit trust fund investing and online trading.

Currently, Sri Lanka has only about 23,000 active investors (defined as at least four transactions per year) which is 0.1% of the population investing in the stock market. To enable financial inclusion, it is essential to expedite the completion of the e-NIC project commenced in 2011. However, the participation of the Sri Lanka's citizenry in the digital economy remain extremely low compared to regional peers. For example, the transformation Indian equity market in the post 1990s to a world-class equity market is attributed mainly to the initiatives by the government of India to increase the retail investor participation with inclusive financing objectives. However, much is yet to be achieved with only 4% of the total population investing in the equity market in India compared to markets such as USA (48 percent), Singapore (20 percent), China (18 percent) and Malaysia (16 percent).

An irrefutable digital ID that is forge proof with biometric data is an essential ingredient of a digital economy. Use of biometrics such as vocal patterns, irises, thumbprints, facial recognition, will add an extra layer of authentication for transactions. The government should bring in policies and regulations making electronic transactions more widespread while encouraging every citizen of the country to enter the digitalized era. One of the key challenges faced in opening any financial account in Sri Lanka is the physical visit required to the financial institution to open an account in order to carry out the "Know Your Customer (KYC)" Anti-Money Laundering (AML) compliance.

At least for low value, i.e. up to Rs.50,000, digital transactions the Department for Registration of Persons should facilitate financial institutions for real-time verification of NIC information such as the name and residential address seamlessly given the NIC number until the e-NIC project is completed.

Conclusion

Unless government implement key reforms such as public enterprise reforms, pension reforms and e-NIC Sri Lanka will have a sub-optimal capital market, like a half-baked cake that nobody can eat. As the history has shown many a time, whether the current or future government will have the political will and insight to carry out the essential reforms required to make the country prosper remains a question.

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DIGITAL HEALTH FOR MEDICINE AND PUBLIC HEALTH IN SRI LANKA

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Sri Lanka has reached to new era with innovative digitalization and digital technologies which are becoming an important resource and cost-effective method for health service delivery system. On "m-Health" the Past decade has witnessed the development and deployment of many institutional based electronic health information systems in Sri Lanka. There are successful and scaled up models (i.e. eIMMR, HIMS, HHIMS, RHIMS and DNMS) which have been implemented with varying levels of maturity at present. There are approximately 27 different health information systems currently used by different directorates, programmes, institutions and focal points of the Ministry of Health. The efforts to integrate the systems at different levels have been identified as a need. Regarding in mHealth and Digital health we have recognized the need to complement our existing health informatic system. Already Sri Lanka has invested in this direction. We plan to make use of digital and mobile health solution as we focus on primary care strengthening also.

WEBISS is being used currently in Epidemiology Unit as a public health complement of Sri Lanka and as a product of improved information and communication technology. The e-Government policy of Sri Lanka has reinforced this decision. The Information and Communication Technology Agency (ICTA) has stepped to improve National Birth and Immunization Registry by using digital technology. This has facilitated National immunization system by reducing and capturing unimmunized children and coverage of immunization clinics. As digitalization of health system follows computer literacy of service providers and it has become a challenge of this field. Internet facilities and coverage is another challenge of digital health when it uses in periphery at field level of Sri Lanka.

Wireless technology has become more popular in each level of public and the use of mobile wireless technologies for public health, or mHealth is an integral part of eHealth, which refers to the cost-effective and secure use of information and communication technologies in support of health and health-related fields. These

mobile wireless technologies have more acceptance capacities among public due to their ease of use, broad reach and wide acceptance. According to ITU statistics which revealed that more than 7 billion mobile telephone subscriptions were existing in across the world in 2015 and over 70% of which were in low- or middle- income countries. Mobile phone usage facilitates public to reach various level and categories of soft wears and different type of health-related soft wears. Hence public is moving automatically towards health seeking practices, as well as promote positive changes in health behaviors to prevent the onset of acute and chronic diseases. It is a positive factor for health delivery system and acceptancy for free health at service delivery point.

South East Asia Regional office (SEARO) of World Health Organization (WHO) has considered mHealth as a neediness of health of Member States, are seeking to identify standardized approaches for applying digital health in health systems and services. Sri Lanka as a member country of South East Asia we can share our digital experience with other countries and welcomes South East Asia Regulatory Network (SEARN) in creating the regularity information, capacity building, cooperation in strategic purchasing, sharing of information on availability and procurement prices of medicine and medical products.

Though, Sri Lanka has universal State-funded healthcare that is free at the point of delivery, more than 50% of our patients seek out patient treatment in the private sector. Therefore, approximately 50% of Sri Lanka's pharmaceutical expenditure is based on out-of-pocket expenses.

Ministry of Health has implemented price reduction of 48 essential medicines for non-communicable diseases such as diabetes mellitus, hypertension, cardiovascular disease and neurological conditions including antibiotics. This have brought great relief to our patients. Hence collective action is needed through digital Health with other counties for our curative and preventive health delivery system maintenance.

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SRI LANKA - SINGAPORE FTA - THE TROJAN HORSE

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Purported free trade agreement (FTA) Sri Lanka had entered into with Singapore is inimical to the interest of Sri Lanka. This agreement totally incompatible with Sri Lanka interests and grants totally unfair and uneven asymmetric advantages and benefits to Singapore's interest at the cost of Sri Lanka's interests.

This is an agreement where Sri Lanka, as a country, agreed upon on preformed commitments in relation to trade in goods and also to services with Singapore. Therefore, this is not just an agreement, where minister of Development strategies and International Trade Malik Samarawickrama committed himself or his close associates to pay for detrimental consequences that are yet to come but we as a country has to face these challenges. Hence, this agreement is subject to the national interest of Sri Lanka. This is the first time in Sri Lankan history, Sri Lanka has liberalized the services sector. More preciously, the Sri Lankan job market to a foreign Nation. According to this agreement, not only the Singapore citizens but any other Nationals can be entered to our job market, investment sector and other service areas by obtaining Singapore Permeant Residency, which is not a difficult task in Singapore. SLSFTA is not an ordinary trade agreement and cannot be compared with any other agreement that we have signed before.

According to the Sri Lankan constitution, any agreement between the Sri Lanka government and any other foreign state, its nationals or corporations, companies and other associations incorporated or constituted under its law for the investments in Sri Lanka, the approval of parliament is necessary by resolution passed by not less than two-thirds of the whole number of Members of Parliament (including those not present) voting in its favor. Unfortunately, Sri Lankan parliament had no clue what so ever, about this FTA even months after it has signed. Moreover, Minister of Development Strategies and International Trade was not bothered to inform the parliament about the said agreement before signing it. Although minister and his secretary Mrs. Chandani Wijewardhane claimed that they have obtained Cabinet approval, Today entire country is aware that they have not obtained the cabinet approval properly and now it is been challenged in the court of low. Several cabinet ministers already declared that they were unaware or was asked for reproducing it to discuss and approve before signing the agreement, which was clearly neglected by the Minister.

There was no consultative process took place before entering in to this agreement. Although many service sector has liberalized through this agreement, ministry has not taken any from the relevant sectors. It is the responsibility of the secretary of the ministry, Mrs. Chandani Wijewardane to conduct a proper consultative and consensus process with the relevant stakeholders before entering in to such important agreements. She has acted undemocratically, exposing many service

sectors such as Engineering, Legal, Architectural, Entertainment, IT industry, Finance sector services in to unrepairable damages. These Ministers and the officials have dragged the country in to a "economical trap" due to their ignorance.

Professionals of this country, made series of requests over the past years to formulate a "National Trade Policy" and enter in to international trade agreements base on the National Policy. Unfortunately, this is exactly what they did not want to do. To eliminate the tremendous pressure and the stern actions of professionals, now they shamelessly play a role of "cunning fox" in order to archive their target. They introduced a so called "New trade policy", which was an article more than a policy, written by a New Zeeland citizen. If one read it, will understanding that it is basically an introduction to a National trade policy and actually there is no "policies" included in it. Therefore, many called it "bogus trade policy" and today it is being rejected by the Nation.

Hence, the process of formulation of Sri Lanka - Singapore FTA is unacceptable, undemocratic and egocentric.

Though the government claimed that its focus is to improve exports by bilateral preferential trade agreements, a few months after signing the Singapore FTA, the government had to accept the fact that no single product of Sri Lanka would be benefited for exports by the Singapore-Sri Lanka Free Trade agreement. If there is no benefit in the goods sector, is there something for us in the services sector? Would you believe, the answer is no again.

while relieving tariffs from 80% of tariff-lines over a period of 15 years for imports from Singapore, Sri Lanka has made commitments to open its service sector for Mode 4 – Movement of natural persons to citizens and permanent residents of Singapore in many sectors namely Telecommunication services, Computer and related services, Insurance brooking and agency services, Banking and other financial services, Transport services by sea-going vessels, Cargo handling services, Storage and warehouse services, Construction-related services, Advertising services, Technical testing and analysis, Hotel and restaurants / catering and Travel agency and tour operator services. The government says that the agreement has not opened the Mode-4, which means movement of natural persons. At the same time, they express that they have open the intra-corporate transfer category. This has been a successful way of fooling people. Intra-corporate transferees is a subcategory of mode-4 and it is the most common way of opening mode-4, movement of natural person. The government clearly lie by saying mode-4 is not open. Mode-4 is opened in the Singapore FTA for the service sectors mentioned above.

Under the category intra-cooperate transferees of Mode 4, either a citizen or a permanent resident who have worked at least one year in a company registered in Singapore can be transferred to a branch, subsidy or an affiliate of that company in Sri Lanka. Though the government explicitly mentions that they can come only with an investment, all that have to do is registering a non-residential company in Sri Lanka as a branch of a registered company in Singapore. Here the agreement is referring to service sectors mentioned above and there are many services which can be started with just a rented place and a few employees brought down under Mode 4 when this is enacted. India and China will demand for the same offer from Sri Lanka which will create huge issues.

Foreigners to bring foreigners to Sri Lanka Singapore registered man power companies are allowed to establish in Sri Lanka which will be in the business of supplying employees to the other companies. A new immigration act is on the table which will allow foreign employees enter Sri Lanka easily since the new act removes the requirement of obtaining an approval from the line ministry while providing sole authority to the Immigration Controller to expedite bringing in foreigners to Sri Lanka. When this act which is fueled by the Ministry of Development Strategies and International Trade is coupled with the commitments made via the Singapore FTA for Singapore registered companies to establish man power companies in Sri Lanka, there is no obstacle for those companies to bringing people from various other countries like India, China and Bangladesh.

Though Sri Lanka has not been offered any preferential benefit by the Singapore-Sri Lanka Free Trade Agreement, Sri Lanka has offered substantial preferences to Singapore in both goods and service sectors over other countries. The Singapore biased market access conditions which prevails now in Sri Lanka will persuade more pressure from India and China to sign comprehensive FTAs with them.

The last resort - Foreign Investments In this context, the Sri Lankan government was left with no arguments to explain the benefits of the Singapore agreement. Then Minister Malik Samarawickrama started saying that Singapore Agreement will bring foreign investments to the country. Theoretically, an FTA might induce foreign direct investment for two reasons. One reason is to get the benefit of import tariff removal when exporting to the other countries abide by the agreement. Since Sri Lanka has not received any such tariff removal benefit, foreign direct investments are not induced for that reason.

The other reason is the dynamism created by the FTA. Due to the reason that Singapore FTA has not bring any benefit to Sri Lanka, it has not created any dynamism as well. The only dynamism as per the government is attracting foreign investments. How can one explain 'inducing foreign direct investments due to foreign direct investments?'

Provided that no real reasons have been created by the Singapore FTA for real and worthy foreign direct investments, the most probable reasons if an investment take place would be to buy Sri Lanka's natural resources or national assets when they are sold out. If that is to be done at all, that shouldn't be done via an FTA making a preference to one country, bypassing the proper tender procedure which prevents the opportunity for Sri Lanka to select the best deal. There might be a chance that Singapore registered service providers to invest in Sri Lanka to get market access to Sri Lankan service sector which will eventually increase the money outflow of the country, further deteriorating the current balance of payment account.

There are many more facts with examples to prove that this SLSFTA is detrimental to our country. Today, almost all the professionals including doctors, lawyers, engineers, architectures, IT professional, Enterprisers, Civil societies and as a whole, the country has rejected it. All have requested for a properly formed National Trade policy. It is the recommendation of the world trade organization, the world authority in international trading as well. We, as professionals will stand for it, solely to protect this country for our future generation.

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