Maratha Vidya Prasarak Samaj's
Karmaveer Adv. Baburao Ganapatrao Thakare College Of Engineering
Nashik-13.
(NAAC ACCREDITED INSTITUTE WITH 'A' GRADE)

DEPARTMENT OF ELECTRONICS &TELECOMMUNICATION ENGG.

Departmental TeChronicle Month: -August 2020

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Department Vision:-

To recognize as excellent department offering competent technical education to create competent electronics & telecommunication engineers for benefits of common masses.

Department Mission:-

Committed to serve the needs of society through innovative teaching learning process, promoting industry- institute interaction to provide competent and cultured electronics and telecommunication engineers.

Greeting,

Department of Electronics and Telecommunication is celebrating "MVP Samaj Din" by unveiling technical newsletter "TeChronicle" VOL-2, ISSUE-2 on 19th August 2020. The day is celebrated to remember all Karmveer of M.V.P. Samaj, it is also birthday of Karmveer Raosaheb Thorath.

Virtual interaction with Mr. Nitin Mahajan(Sr. G.M., BSNL):

As we are stuck in very unique situation due to the COVID 19 – Pandemic which disrupted our daily routine and forced us to stay at remote location. In this situation we are been bounded together by our phone and broadband technology, all which is supported by the Telecommunication Industry.

The telecommunication industry is within the sector of information and communication technology is made up of all telecommunications/telephone companies and internet service providers to play a crucial role in the evolution of mobile communications and the information society. The telecom sector continues to be at the epicenter for growth, innovation, and disruption for virtually any industry.

We are talking about Mr. Nitin Mahajan – Sr. G.M. at BSNL.Served the telecom industry for the last 26 years. He completed a Bachelor's in Electronics Engineering from the College of Engineering, Pune(1986-1990). He completed M.Tech in Communication Engineering from the Indian Institute of Technology, Bombay(1991-1993). During this period Sir has been selected for IES batch of 1990 and cracked Civil services exam of 1994 with all india rank 249. Sir joined BSNL as Deputy G.M. in 1994. In 2010-11 he completed an Executive Diploma in Finance from Nirma University, Ahmedabad. After this, he became the Sr. G.M. in BSNL.

Student: According to you, In this crucial Covid-19 Pandemic period how BSNL is coping with data rate requirements as everyone is working from home?.

Answer: As you know, since March-2020 all countries are in lockdown and almost everyone is working from home and there is a huge requirement of bandwidth everywhere. Nashik BSNL has provided more than 5000 connections in this period. Due to the increase in data rate requirement now, the telecom sector provides 30-35% of GDP which was previously only 6%.

Student: What is 5G technology? According to you, what infrastructural changes should be done for 5G?

Answer: 5G is the future for the telecommunication sector. It requires very high frequency and bandwidth.5G has speed upto 1Gbps. 5G is the biggest revolution all over the world. we know, when frequency increases wavelength decreases and as wavelength decreases , the size of the antenna is reduced. But in the case of 5G, the number of cell sides will increase to a huge extent and the height of the tower will decrease.

Student: What are the career opportunities in the telecom sector for students? What do you expect from young engineers like us?

Answer: Telecom sector provides a wide range of opportunities. Lot of expenditure is there in the telecom sector. In upcoming years, augmented reality and 5G connectivity will play a major role in providing employability. Engineers in today's generation must possess vast knowledge. Students expect that everything should be taught in college itself which is not possible. Hence they must take efforts on their own.

We had very cheerful technical conversation with sir for almost one and half hour where we had discussion on various aspect of Telecom industry like 5G, upcoming trends and opportunities in the domain.

Economy crisis in India and COVID-19 pandemic : [Mr. V. P. Gawai, Assistant Professor, Dept. of E & TC]

The discovery of the coronavirus (SARS-CoV-2) and the spread of COVID-19have led many governments to take drastic measures. The lockdown of large parts of society and economic life has come as an external shock to many economic actors, not least innovative start-ups. The lockdown measures as a response to the spread of the new coronavirus threaten the existence of many innovative start-ups. Start-ups are successfully leveraging their available resources as a first response to the crisis, their growth and innovation potential are at risk. Therefore, policy measures should not only provide first aid to start-ups by alleviating the pressure caused by constrained cash flow, but also involve long-term measures embedded in and supported by the wider entrepreneurial ecosystem to ensure rapid recovery and growth.

1.Introduction:With the discovery of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in late 2019 and very recently with the subsequent pandemic of COVID-19, society and economies worldwide are experiencing an unprecedented exogenous shock. Although the occurrence of a pandemic caused by a new virus is unsurprising for virologists, the infection control measures such as social distancing taken to slow the spread of COVID-19 exert tremendous pressure on large parts of a nation's economy. Most actors central to shaping the economy would admit to the current pandemic being a metaphorical black swan event, that is, a surprising, unpredictable event of great significance and severe consequences that dramatically changes the political and economic environment. While such events could be interpreted as opportunities, the unprecedented lockdown of large parts of society arising from the COVID-19 crisis marks the current situation out as an acute crisis.

2. SARS-CoV-2 triggered a twofold crisis: The COVID-19 pandemic has placed an unprecedented burden on many health systems worldwide, and the infection control measures have caused an economic crisis by bringing a vast amount of economic activity to an abrupt halt.The COVID-19 pandemic has developed globally and the necessary countermeasures put in place have hurt economies suddenly.Currently, the focus is on protecting the present while the future of economic activity receives less attention. However, innovative start-ups that will shape that future economic activity are one of the most vulnerable actors in any. This situation is likely to worsen in times of crisis and the spread of COVID-19 thus threatens to curtail a tremendous potential for innovation that has been accumulated in recent years and was meant to generate economic and potentially societal and ecological value in the near future.

3. Challenges for innovative start-ups created by the COVID-19 lockdown:Beyond the humanitarian tragedy of the COVID-19 pandemic, the virus is also having a growing impact on local economies and the global economy. Fears surrounding the unforeseeable effects of COVID-19 have already influenced the world's top economies and many economists are now forecasting recession. Unfortunately, to manage a crisis well, preparation is essential, and few start-ups would have been prepared for a crisis of the magnitude of the COVID-19 pandemic. Generally, the specific characteristics of innovative start-ups should enable them to be better prepared to cope with the COVID-19 crisis than other types of firms.

4. Challenges of the COVID-19 lockdown in India for the economy:Most of the nations across the world have implemented complete lockdown with stringent social distancing measures for breaking the chain of transmission. The current outbreak of COVID-19 is heavily impacting global health and mental health. Despite all resources employed to counteract the spreading of the virus, additional global strategies are needed to handle the related mental health issues. To protect people and prevent the spread, it is critical that public mental health paradigms and measures are used. On 30 January 2020, India reported the first case of COVID-19 and the numbers have risen steadily since then, albeit at an alarming rate in the final days of March. Aiming to control community transmission, the world's largest democracy has implemented the world's largest nationwide lockdown since 24 March 2020. The country remains vulnerable towards COVID-19, given the high population density, socioeconomic fabric and overstretched health-care infrastructure. The total lockdown was the only immediately available, best and ideal solution to the control COVID-19 pandemic in India and the government has responded appropriately, adequately and quickly to the COVID-19 pandemic at multiple levels. The lockdown has helped India in buying crucial time: time for extensive contact tracing, time to ramp up testing and most crucially, time to prepare our health system, increasing its health-care infrastructure and preventing it from overwhelming, as it happened in Italy, the United States and Spain. However, this is very challenging with added difficulty for larger sections of the society. The social distancing is very difficult for many households in India, especially slum areas; the daily-wage earner has to earn daily money to keep family alive, and people with existing mental health illnesses face severe issues. A long-time lockdown may lead to psychosocial difficulties for vulnerable populations and consequently lead to stress, anxiety, frustration, boredom and depression and even suicidal ideas and attempts. also highlighted the mental health needs of vulnerable groups, including those with severe mental illness, learning difficulties and neurodevelopmental disorders, as well as socially excluded groups such as prisoners, the homeless and refugees. Nevertheless, the burden of this infection on global mental health is currently neglected even if it may challenge patients, the general population as well as policy makers and health organisations and teams. India's health inequalities, flaring economic and social disparities and distinct cultural values had made lockdown a hard measure for the poorer sections of the society. The extended lockdown will lead to economic hardship, famine, psychosocial challenges and law and order issues, which may in turn undermine benefit gauge by lockdown and COVID-19 containment objectives. In Indian settings, this may exacerbate health inequalities and reinforce the vicious cycle between poverty and ill health. The social and economic issues due to COVID-19 pandemic will result in mass unemployment, depleted social safety nets, homelessness, increase in gender-based violence, alcoholism, hunger, loan defaults and millions slipping into poverty. This post-COVID landscape will definitely lead to an increase in mental health issues such as chronic stress, anxiety, depression, alcohol dependence and self-harm. Recent evidence in psychosocial sciences also show that similar pandemics increased the prevalence of symptoms of post-traumatic stress disorder (PTSD), as well as confusion, feeling of loneliness, boredom and anger during and after quarantine. Lot of things need to be done, the real need is to build community-based capacity to handle local issues long after the acute phase of the epidemic. A small team of peer counsellors work under a local administrator and trained on community mental health issues

Conclusion:This is an opportunity for India to recognise the importance of strong public health systems and increasing investment in health for making its health system resilient towards future pandemic. The governments need to step up to protect their populations and people in a non-threatening, non-panicky manner to ensure safety of all individuals. The country should focus more on improving primary care, health-care infrastructure and human resources for health. India's public health-care system is chronically underfunded (at just 1.5% of GDP), leaving primary care weak. This pandemic could be the much-needed wake-up call to the necessity of long-term changes to India's health system

Reference:

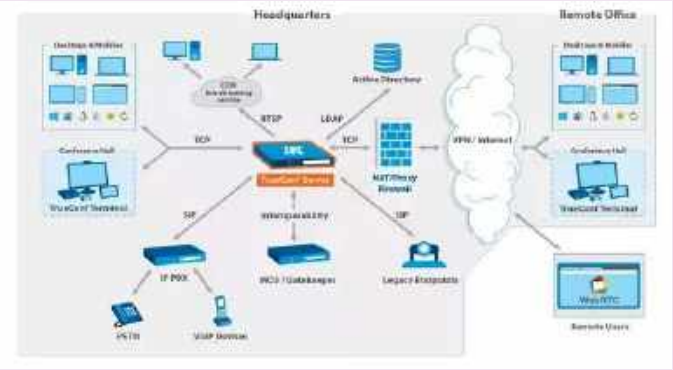
https://journals.sagepub.com/doi/full/10.1177/0020764020935922
GDA (Global Data Analysis), 2020. Coronavirus (COVID-19) Executive Briefing. Global Data.

Rise of Video Conferencing Apps during Covid-19 pandemic [Mr. Pranil Chavan, B.E E & TC]]

1.What is video conferencing?: Video conferencing describes online meetings that take place over the internet to connect video conferencing systems in meeting rooms with personal devices such as laptops or mobile devices with embedded webcams. Utilizing a simple, unified video conferencing solution with support for screen sharing empowers your global teams to be more connected, productive and engaged

2.Overview of working of video conferencing…: Video input from the camera and audio input from the microphone are converted to digital data. Software is used to compress the data so that it can travel more quickly via ISDN lines, broadband Internet or WiFi. When the data reaches its destination, it's decompressed to be viewed on a computer monitor or television screen and heard through speakers. Acoustic echo cancellation software is used to remove sound interference and eliminate delays so that sound and visual are in sync

3.Rise of these apps during covid-19 pandemic..: Video conferencing software and video chat applications have seen a huge surge in demand as a result of the COVID-19 pandemic. In March, video conferencing apps saw a record 62 million downloads. Much of the growth is due to increasing adoption of platforms like Google Meet, Microsoft Teams and Zoom as



businesses and educational institutes switched to remote working to limit the spread of the virus.Social-distancing has also meant that people have had to move their social lives online. There has been an increase in the numbers using video conferencing software to connect with friends and family as well as to attend virtual quizzes and exercise classes. Major advancements in technology have drastically changed how and where we conduct business with more people working remotely, the rise of instant, on-demand communications and the globalization of businesses. For modern and innovative businesses to grow and globalize, building and maintaining quality relationships with partners, suppliers, internal teams, investors and customers is essential. Video conferencing boosts productivity, saves time, reduces travel expenses, and overall promotes collaboration. The advantage of video conferencing is the ability to facilitate all of those benefits without requiring constant travel for face-to-face communication.

Reference:

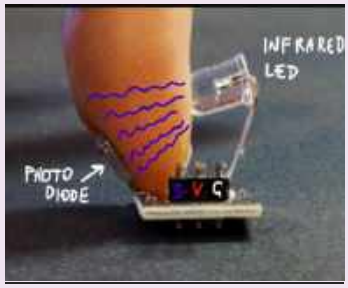
https://www.businesswire.com/news/home/20200507005631/en/COVID-19-Outbreak-Video-Conferencing-Demand-Rises-due

https://science.howstuffworks.com/how-military-video-conferencing-works1.htm

Oxygen saturation and Covid-19

[Ms. Pragya Rai, T.E ETC]

In this incredible period of our life we've learned a lot of things about viruses, lungs, surgical masks, soap and washing hands. Everybody read about symptoms like coughing, fever and breathing difficulties. We've also known that one way to measure this breathing difficulty is reading the amount of oxygen in our blood. This measure can be read indirectly with a medical device called an oximeter. You have probably already seen it, it's a non invasive device that is placed on a finger with some pulsating lights that do the work. Normally, when you're ok, you have a percentage of oxygen saturation near or greater than 95%. When saturation goes down below 90% and you have cough and fever, it's a problem.



1,How does an heartbeat sensor work ?To measure oxygen saturation, we first need to learn how a heartbeat sensor works. an heartbeat sensor named KY-0039 which is made with an infrared led and a photodiode. The photodiode must be able to receive 940nm infrared light. Since we also need (in next steps) to receive the red light (if you're building the sensor from scratch) you will need a photodiode with a wide spectral range to receive light new 600nm (red) and near 940nm (infrared); this one seems ok: LPT 80A As you can see in the circuit, it's just a infrared led that lights a photodiode. There are also two resistors to protect the led and read the small signal from the sensor. The finger is placed between the photodiode and the infrared led like this photo The light emitted by the infrared led is partially absorbed by the nail, the skin, and all the other parts of your finger, but it's not constant because it changes following the changes of the blood running in your veins. When your heart makes a beat the blood is pushed in your veins and the light absorption changes. With the Spin of KY-039 we can measure the current generated by the light absorbed by the photodiode.

2.How to hack the KY-039 sensor to find oxygen: Our blood absorbs light in a different way with the change of the wave-length of the light. The red light is absorbed better by the blood with more oxygen, so we can compare the measures and find the percentage

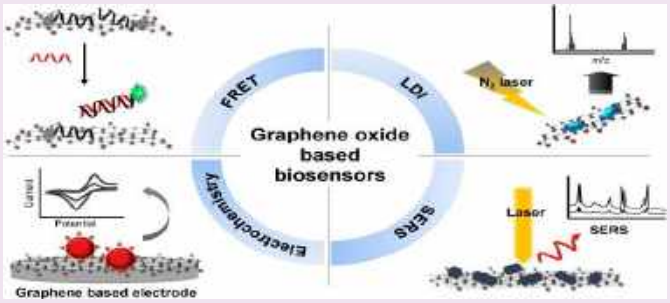
Reference: **https://hackaday.io/project/170752-oximeter-do-it-yourself**

Role of Electronics in Pandemic:

[Shivani Phadtare, SE, E & TC]

During the covid-19 pandemic electronics manufacturers look forward to fighting it efficiently along with the backbone of police, doctors, health workers etc. From ventilators to drones to highly sensitive AI robots that are of great help in the hospitals, electronics have influenced the world for quite a long time now. Let us jump to see some of the automated inventions, as these are the key equipment during the pandemic.

1.Graphene Bio Sensor: A biosensor is a device which



measures biological or chemical reactions by creating an electrical output response that is proportional to the concentration of a particular substance within that reaction. Graphene has emerged as the new “wonder material” for biosensors thanks to its unique physical and chemical properties. The main reason for researchers to

use this detection approach is because this method is simple, rapid and presents good sensitivity. Sensors consist of two elements: a receptor and a transducer. The receptor is the organic or inorganic material that interacts specifically with the target molecule. The transducer is the part of the sensor, which converts chemical information into a measurable signal. Graphene-based nanomaterials are used as transducers of biosensors, which are involved in converting the interactions between the receptor and the target molecules into detectable measurements. Further research is undoubtedly required but we foresee that graphene may have a leading role in the world fight against COVID-19.

2.Bluetooth wrist bands: Governments around the globe empower solid and recouped individuals to go out and collaborate in the open once more. The primary steps governments are taking to empower computerized contact following is utilizing Bluetooth innovation to follow back contacts of affirmed cases. Once followed, contacts can be rapidly and privately told to look for testing, self-seclude, and utilize prudent steps. Since, not every or a large portion of the total population uses its own cell phones, on account of advancements in IoT innovation, Bluetooth arm bands cost only a dollar or two and run for a long time on a coin cell battery. Subsequently, in places where individuals don't use cell phones, governments can moderately send Bluetooth armbands. In a perfect world, Bluetooth wristbands and cell phones can supplement each other in empowering a viable computerized following arrangement. Additionally, a Bluetooth wristband doesn't have to know anything about its client's character to carry out its responsibility. So it's safe regarding privacy concerns.

Reference:https://nenow.in/health/ https://www.electropages.com

A ray of hope in pandemic

[Ms. Rutu Raka, T.E ETC]

We all have witnessed a lockdown in the month of march when the entire country was shut down. With every breath we were breathing fear. Various precautionary measures like sanitizers, masks were used and still weren't sufficient to eliminate the dreadful virus. Amid all the chaos I once stumbled upon the UV technology used for disinfecting purposes. UV light was a fresh concept for me and I started researching. The rays were naturally found in sunlight which is the best source of disinfection. UV light is mainly divided into 3 parts. UV-A which has the longest wavelength. UV-B which has comparatively shorter wavelength and UV-C with the shortest wavelength of all. It is already used in the medical sector to sanitize. Studies said that UVC was not that harmful for human skin and eyes but was effective for germicides, virus and bacteria. In addition to that, using it for fruits and vegetables prevented microbial growth and made it safe to consume. As designers we are taught to walk through a process of ideation before prototyping, so on a little ideation and discussion with my dad, Suhas Saraf who is an industrial manufacturer we developed our UVC chamber under Vasundhara Enterprises. This is a disinfection box comprising of European grade UV tubes placed in a way to clean the object from all directions. This had to be a user friendly product so we fixed a timer ranging from 15 seconds to 15 minutes and a buzzer to draw attention once cleaning was done. To ensure safety a micro switch was placed at the door so in case of accidental opening of door the buzzer would beep and switch off the lights automatically. Any product like wallet, cash, files, footwear, clothes (major carrier of virus), fruits etc. Can be placed in the box. This process took almost a month and the main task was to test the product. So, we got it tested from a government approved laboratory and got amazing results!

The E coli bacteria colony was cleared in just 5 seconds of exposure. This was a green signal to go ahead with the process and manufacture it under "Vocal for Local" and " Make in India ". In this pandemic me and my dad could contribute for a noble cause of protecting people from the virus through our product. We soon are coming up with a series of UV clean products soon.

Reference:
https://www.ccohs.ca/oshanswers/phys_agents/ultravioletradiation.html

Electronics v/s Covid-19

[Mr. Shubham Suryawanshi, T.E ETC]

Hands-free door openers: Several varieties of hygiene-friendly door-hook are in the pipeline – intended to help us navigate that tricky moment when we need to open doors with sanitized hands.Epidemiologists estimate the coronavirus can live on surfaces like stainless steel for three days, so these devices could be a game-changer in environments such as hospital wards, where hand sanitation is a matter of life and death.In an era of widespread 3D printing and high-tech software – and at a time when many large-scale manufacturers, including Dyson and Ford, are shifting their attentions to manufacturing medical hardware – small-scale producers are leading the way like never before.And not every design needs to go to market. Welshman Wyn Griffiths devised a hands-free door opener – which clips onto door handles and can be operated using the forearm – after his wife visited a hospital and saw the difficulties staff were facing. Griffiths has since distributed the 3D design online for free and is asking people to print and distribute the handles wherever possible.

Smart Helmet: Though smart technology is not a new concept, it is being repurposed to detect possible virus symptoms in public spaces. Police forces in Dubai have recently deployed a thermal imaging smart helmet, designed to detect people running a high temperature — a common symptom of COVID-19.Some places in the U.S. are using similar thermal imaging technology in stores, to detect if customers walking in are potentially running a fever

Reference: https://www.cbsnews.com/news/coronavirus-pandemic-innovation

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