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

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Department Vision:-

To be recognized as an excellent department offering competent technical education to create competent electronics & telecommunication engineers for the benefit of the common masses.

Department Mission:-

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

Program Educational Objectives:-

1. *To impart state of art technical education in the Electronics & Telecommunication Engineering.*
2. *To promote society beneficial projects and activities.*
3. *To develop soft skill, team work, professional ethics and multidisciplinary approach for the carrier enhancement.*
4. *To bridge the gap between Industry-Institute through collaboration with Industries, Institutions and Universities.*
5. *To provide suitable infrastructure and facilities in tuned with advancing technological evaluation.*

Greeting,

Department of Electronics and Telecommunication is celebrating national science day by unveiling technical newsletter "TeChronicle" VOL-3, ISSUE-4 on 28th February 2022.

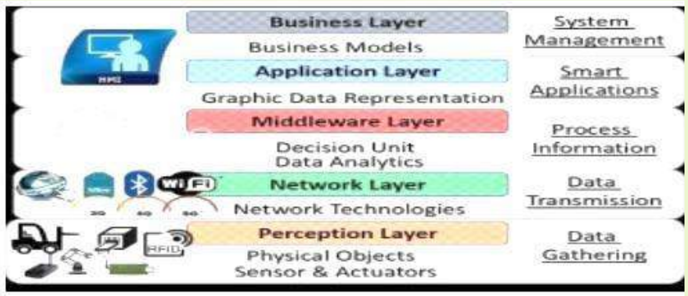
The day is observed every year to commemorate the discovery of the 'Raman Effect' by Sir C.V. Raman on 28th February 1928. He was awarded the Nobel Prize in Physics; 1930 for the same.

Building Resilient IOT Infrastructure:

[Prachi Jorwar TE E&TC]

The Internet of things (IoT) introduces both security and epistemic challenges having to do with data ontology, network science, social science and system engineering. This article describes techniques and methods used to enhance the resilience of IoT infrastructure in each layer. Finally, this state of the art allows us to identify the prerequisites and the insufficiencies of these solutions and to begin to analyse the potential improvements including the proposal of an architecture that implements the resilience mechanisms in four levels of the five-level IoT Architecture and assures an overall resilient system. Resilience of the system defined in this Figure includes the capability 1) to resist external perturbing events and internal failures Resilience of the system defined in this Figure includes the capability 1) to resist external perturbing events and internal failures 2) to recover smoothly and re-enter a stable state 3) to adapt its structure and behaviour to constant changes.

There are also concepts where a service is allowed to "degrade" e.g. deliver only a part of its functionality or displays decreased performance to prevent the denial-of service. The loosely coupled infrastructure of the IoT ecosystem enable seamless connectivity patterns that span heterogeneous industries and networks—often using public networks and application programming interfaces (APIs)—the ever-expanding IoT ecosystem introduces architectural, operational and security challenges.



This figure shows an improved IoT infrastructure with one more additional layer that is the processing layer, called by some researchers “Aggregation layer”. It coordinates information processing, and converts the data into a standard format. Large data sets are analysed, stored and processed. It can use servers, cloud computing and tools for large data processing. Cloud brings unique challenges and opportunities to DevSecOps practitioners to design resilient IoT infrastructure. The Cloud Application Programming Interface (API) enables automation opportunities in scale but also changes fundamental control constraints that are well engineered in physical data centre. The opportunities to develop cloud agnostic security infrastructure and controls are design constraints in security engineering but as cloud evolves, the standardization will be more inevitable.

Internet of Things (IoT) has introduced enormous benefits to society over the years. With great power there must also come great responsibility to protect it. As the number of IoT devices grow and become embedded into the corporate ecosystem and so is the need to provide security for it as a top priority. The challenge is many IoT devices were not designed with security in mind. Many devices do not have an interface, lack basic security features, and simply cannot be updated or patched in the event of software vulnerability. The global workforce continues to be digitally dispersed across the home and office devices this provides a unique challenge for security and risk leaders to overcome. This is further complicated as IoT devices move outward to partners and the larger supply chain.

IoT will help to enable an environment with the flexibility to provide services of all sorts, ranging from home automation to smart retail/logistics, and from smart environmental monitoring to smart city services. In a very short time, the IoT will have sensing, analytics and visualization tools, which can be accessed by anyone, anytime and anywhere in the world on a personal, community or a national level. The IoT will increasingly rely on cloud computing, and smart devices with sensors built in, along with thousands of applications to support them.

In this article, a survey about the resilience techniques and approaches was made. In addition, the different IoT architectures were presented and a new five-layer IoT architecture that implements the resilience mechanisms in every layer was proposed. It implements the resilience mechanisms in all the IoT layers which ensure resilient infrastructure, communications, data processing and applications. This topic requires further research particularly as more devices and services are continuously integrated into the IoT systems.

Technology Connects Education:

[Sakshi Musale SE E&TC]

Education is about learning skills and knowledge. It also means helping people to learn how to do things and support them to think about what they learn through education, the knowledge of society, country, and of the world is passed on from generation to generation.

Technology is science or knowledge put into practical use to solve problems or invent useful tools.

An example of technology is the Internet which has made up-to-date information available to anyone with access in a matter of moments and provides real time information about events around the world.

What does technology mean to us?

Today, technology means life itself. It’s a tool that has made people more useful, saved time and even inspired people to be more creative and innovate to apply it in all fields every single day.

Technology made revolutionary changes to our lives. As human population grew, we are very much aware that which kind of plants to grow in various climates and conditions, this is possible because of technology enhancements. We all have now access to information how we can improve agriculture, boost food production, increase food supply, results in making overall life better for everyone.

Many changes and industrialization has brought up by technological development. The social changes brought by technology was introduced in 14^{th} to 16^{th} century, when mankind struggling to improve our circumstances, and introduced printed press which was acknowledged as one of the important technological development on that time.

In light of the access of modern technology, social media, and new learning models that

Reconfigure the time and place learning happens, it doesn’t have to be that way. Schools can evolve while simultaneously growing closer to the people they serve.

As we are well known about corona pandemic, it was a horrible situation faced by the world. Due to this everything has collapsed like economic growth, education system too. Each and every student had to learn via online mode that we can certainly say that technology connects the education. Though technology connects the education in whole the world it has a pros and corns too.

• Technology vs Social Media

Technology has many forms, but in education, it is most visible in terms of computing hardware and software. The hardware is pretty obvious— phones, iPads, personal computers,

Macs, Chrome books, graphing calculators, and the like. The software is a bit more inconspicuous because it's embedded in the hardware.

There are also less visible forms of technology that make teaching and learning with technology possible, including electricity, wiFi (imagine your classroom looking like it does behind your television—wires everywhere), the cloud (which enables mobile learning, hardware sharing, flipped classrooms, and other advances), and more. Each of these

Technology tools is critical in their own way, working together to make whatever we'd define as a 'modern classroom' and 'modern learning' work.

• How To Connect Schools And Communities Using Social Media

As we are familiar that online lectures information reaches to students via social media like Whatsapp.

• How To Connect Schools And Communities Using Technology

As technology connects the education but it seems somewhere lagging in education, students become lazier due to technology .As pros are we are getting more time for self-study, to develop more qualities within limited time on the other hand, cons are students are like spoon feeding, dependent etc.

Innovative ways to use technology in education

1. **Podcast Do Matter**

Podcasts for all your academic lessons can aid you with the teaching process in the long run especially, motivational podcasts, online learning platforms, interviews, and online courses. Likewise, there are a lot of podcasts available online on various topics of interest.

Few examples of podcasts that you can include in your classroom:

Basic research on an academic topic Lectures from other educators Podcasts blogs.

2. **Presentations With Multimedia:**

Text-only slideshow presentations are behind the times due to its monotonous content delivery. Also, it's evident that slideshow presentations are already a part of your educational curriculum. Therefore, if you add a variety of multimedia elements to the performances, it could capture the attention of students for a long time.

Few examples of multimedia elements you can include in your classroom:

• Colourful Images Gifs
• Short video clips Graphs Animations Sound Tracks

3. **Take Your Students on a Virtual Tour:**

Who doesn't get excited about field trips? We all do. With technology in education, cancelling trips due to logistical issues is not going to happen anymore. Additionally, you can simulate a virtual field trip with Google Cardboard.

4. **Keep Your Class Schedules Online:**

Google Calendar helps you create and share a class calendar. This keeps your students informed about the class, duration, and important dates. Therefore, emailing your calendar's hyperlink to your students will do wonders. This will help you stay organized, in turn, make students come prepared for each class.

5. **Video Feedback, Quiz, and Surveys:**

You could record personalized feedback on student's work as a video. Also, allow students to give peer feedback through videos. Therefore, this could help students speak an opinion instead of keeping it writing focused.

Reinforcing mathematical concepts with virtual manipulative allow students to in understanding complex concepts. Therefore, incorporating the use of virtual manipulative in classrooms is not only comfortable but appeals to hands-on learners as well.

Throwback, it's possible that there is no time in the history of education that our systems of educating have been so out of touch with the communities. Growing populations, shifting communities, and increasingly inwardly-focused schools all play a role.

Conclusion is that technology connects the education as well as world; it's up to person to person how to choose a way.

E-Waste Management:

[Tanvi Patil TE E&TC]

"Reuse the past; Recycle the present, Save the Future!!"

"Say No to E-Waste!"

The calamitous sequel for health and the ecology of exposure to waste products from human consumption have long been perceived. A relatively recently recognized hazardous waste product comes from discarded electrical and electronic equipment (EEE). In India, the quantity of "E-waste" or electronic waste has now become a major problem. According to "STEP" (Solving the E-waste Problem Initiative), the 2012 global generation of e-waste totalled 45.6 million metric tons. Disposal of e-waste is an emerging global environmental and public health issue, as this waste has become the most rapidly growing segment of the formal municipal waste stream in the world. E-waste or Waste Electrical and Electronic Equipment (WEEE) are loosely discarded, surplus, obsolete, broken, electrical or electronic devices.

E-waste is a global, interregional, and domestic problem around 20 million to 50 million tons generated yearly, it is appraise that 75% to 80% is shipped to countries in Asia and Africa for "recycling" and disposal. Loopholes in current e-waste canon allow for the export of e-waste from developed to developing countries under the guise of "donation" and "recycling" purposes. The Parties to the Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and Their Disposal (The Basel Convention), launched The Partnership for Action on Computing Equipment (PACE) to facilitate environmentally sound management of used and end-of-life computing equipment.

E-waste recycling can lead to direct or indirect exposure to a variety of hazardous substances that are contained in EEE or formed and released by unsafe recycling practices.

Following are the E- Waste rules (2016):

- Manufacturer, dealer and Producer Responsibility Organization (PRO) have been introduced as additional stakeholders in the rules.
- The applicability of the rules has been extended to components, consumables, spares and parts of EEE in addition to equipment as listed in Schedule I.
- Compact Fluorescent Lamp (CFL) and other mercury containing lamp brought under the purview of rules.
- Collection mechanism based approach has been adopted to include collection centre, collection point, take back system etc. for collection of e – waste by Producers under Extended Producer Responsibility (EPR).
- Option has been given for setting up of PRO, e – waste exchange, e – retailer, Deposit Refund Scheme as additional channel for implementation of EPR by Producers to ensure efficient channelization of e – waste.
- Provision for Pan India EPR Authorization by CPCB has been introduced replacing the state wise EPR authorization.
- Collection and channelization of e – waste in Extended Producer Responsibility –

Authorisation shall be i n line with the targets prescribed in Schedule III of the Rules. The phase wise Collection Target for e – waste, which can be either in number or Weight shall be 30% of the quantity of waste generation as indicated in EPR Plan during first two year of implementation of rules followed by 40% during third and fourth years, 50% during fifth and sixth years and 70% during seventh year onwards.

- The e–waste exchange as an option has been provided in the rules as an independent market instrument offering assistance or independent electronic systems offering services for sale and purchase of e – waste generated from end–of–life electrical and electronic equipment between agencies or organizations authorised under these rules.
- The manufacturer is also now responsible to collect e – wastes generated during the manufacturing of any electrical and electronic equipment and channelize it for recycling or disposal and seek authorization from SPCB.

Direct exposure to E-waste entails skin contact with harmful substances, the inhalation of fine and coarse particles, and the ingestion of contaminated dust. Individuals who directly engage in e-waste recycling

with poor protection incur high levels of direct, occupational exposure. Unsafe recycling techniques used to regain valuable materials often increase the risk for hazardous exposures. There often is a lack of suitable off-gas treatment during such recycling processes, particularly smelting.

The economics of e-waste hinge on many factors, some a result of technological developments, some on macro and micro-economic aspects while others are defined by the laws of physics. The overriding techno-economic trends and factual realities of the system taken together mean more diffused products that are difficult to collect and take back. Combined lower intrinsic material value necessitates top-up incentives from producers for collection and recycling.

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