RSM POLY NEWSLETTER – MAY 2021

ABOUT MVP SAMAJ

The **Maratha Vidya Prasarak Samaj** is one of the most prestigious centers of learning in the State of Maharashtra. It manages 485 educational units and is one of the premier educational hub in the Nashik district.

At present, more than 2 lakhs of students are pursuing education. Over past 106 years, the institute has stood the test of time to become legend of unparalleled stature. History says that the credit for the birth of M.V.P. Samaj goes to the young, enthusiastic & devoted team of social workers and educationists who were inspired by the lives of Mahatma Jyotiba Phule, Savitribai Phule and Rajarshi Shahu Maharaj of Kolhapur. These young leading lights include Karmaveer Raosaheb Thorat, Bhausaheb Hire, Kakasaheb Wagh, Annasaheb Murkute, Ganpat Dada More, D. R. Bhonsale, Kirtiwanrao Nimbalkar and Vithoba Patil Khandalaskar, who laid the foundation of the Samaj. They were the men who envisioned the culture and knowledge centric society. The great visionaries of MVP Samaj rightly laid the "Well being and happiness of masses" as the motto for the Samaj.

ABOUT RSM POLYTECHNIC

The **Rajarshi Shahu Maharaj Polytechnic** has been established in the year 2008, at the central place in Nashik. It is affiliated to MSBTE, Mumbai and approved by Government of Maharashtra, DTE Mumbai and the AICTE, New Delhi. The Polytechnic is in the process of Accreditation and Gradation. The Polytechnic has well-equipped and well-furnished laboratories, workshop and hostel facilities. Every department has separate computational facilities along with LAN, Wi-Fi and necessary software. At present the RSM Polytechnic provides three-year courses leading to Diploma in Engineering of MSBTE, Mumbai in the five disciplines: Mechanical Engineering, Computer Technology, Electronics and Telecommunication Engineering, Information Technology and Electrical Engineering.
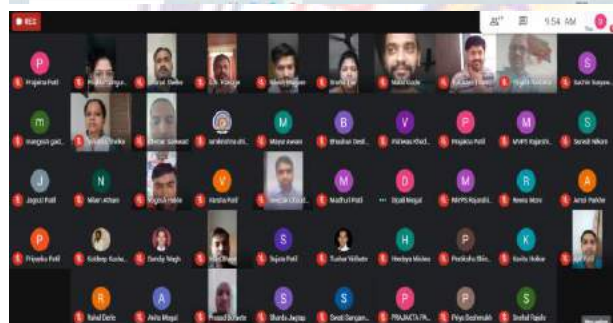
VISION AND MISSION

VISION:

- To Empower the Common Masses by providing Quality Technical Education.

MISSION:

- To create and implement innovative best practices to achieve academic excellence.
- To enhance the overall development of students by imparting essential skills.
- To inculcate principles of professional activities by promoting industry institute interaction and entrepreneurial skills.
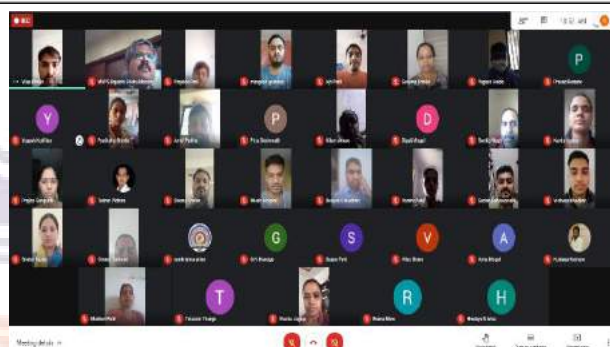- To create an environment awareness for sustainable development.

Maratha Vidya Prasarak Samaj's
Rajarshi Shahu Maharaj Polytechnic, Nashik
Udoji Maratha Boarding Campus, Near Pumping Station, Gangapur Road, Nashik-13.

RSM POLY Affiliated to MSBTE Mumbai, Approved by AICTE New Delhi, DTE Mumbai & Govt. of Maharashtra, Mumbai.

MVP RSM Polytechnic

- **Maharashtra Din and Labor Day Celebration (1st May 2021)**

Maharashtra Din and Labor Day was celebrated in the institute by faculties and supporting staff members in Online Mode.

- **Death Anniversary of Rajarshi Shahu Maharaj (6th May 2021)**

A Death Anniversary of Rajarshi Shahu Maharaj was celebrated in the institute by faculties and supporting staff members with social distancing.

- **Conducted Guidance Session on IPR (7th May 2021)**

Online Guidance session on Intellectual Property Rights had organized and conducted by MVPS'S Rajarshi Shahu Maharaj Polytechnic Alumni Association for Alumni. Prof. S. A. Suryawanshi, IPR Coordinator was delivered Lecture. The

event was coordinated by Prof. N. A. Gade,
Alumni Coordinator.

- **Summery of Work from Home during Lockdown from 1st May 2021 to 31st May 2021**
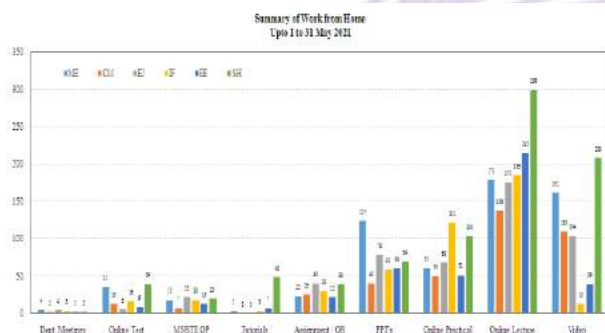
MVPS'S Rajarshi Shahu Maharaj Polytechnic's Faculty and Staff had conducted Online Lectures and other activity for students for AY 2020-2021. E-study material prepared by faculty and staff and uploaded on his/her Wordpress blog and Youtube channel and circulated in students.

NEWSLETTER: MAY 2021

Mechanical Engineering Department			Computer Technology Department		
Sr #	**Activities**	**Date(s)**	**Sr #**	**Activities**	**Date(s)**
1.	Delivered Guest Lecture on Casting Processes.	4th May 2021	1.	Conducted Expert Lecture of Web Development	31st May 2021
2.	Attended Webinar Series on National Technology Day celebrations: 2021 "Advance Technologies and Applications in Engineering".	11th May 2021 to 14th May 2021			
3.	Attended Webinar on Opportunities for Youth in ISHRAE.	25th May 2021			

Electronics & Telecomm Department			Information Technology Department		
1.	Organized Online Quiz on Rajarshi Shahu Maharaj Life and Entire Tenure.	6th May 2021	1.	Conducted Expert Lecture of Cloud Computing	5th May 2021
2.	Attended Webinar on Basic of Patents.	6th May 2021	2.	Conducted Expert Lecture on Data Science	8th May 2021
3.	Conducted Guest Lecture on Information Theory & Coding Techniques	18th May 2021	3.	Conducted Expert Lecture on Emerging Trends in Information Technology	15th May 2021
			4.	Conducted Expert Lecture on Guidelines for Publishing Papers	30th May 2021

Electrical Engineering Department			Science and Humanity Department		
1.	Organized Virtual Industrial Visit to 33/11 KV Substation Amravati	25th May 2021		--	
2.	Conducted Expert Lecture on Solar Power System and Hybrid Electrical Vehicles	28th May 2021			

Mechanical Engg. Department

- **Delivered Guest Lecture on Casting Processes (4th May 2021)**
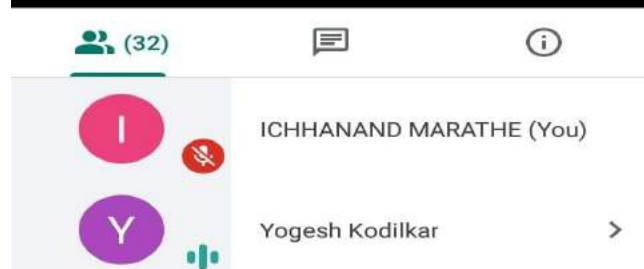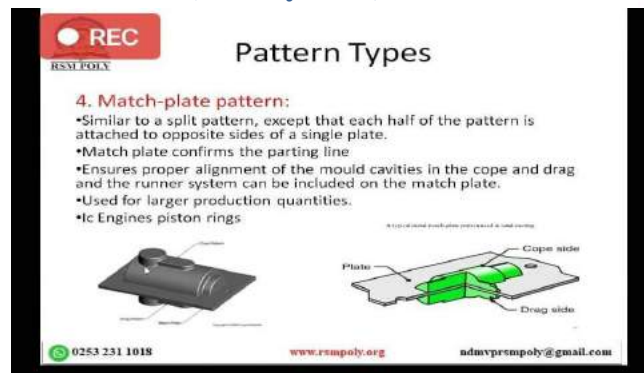
Online Guest Lecture on Casting Processes had delivered by Prof. Y. R. Kodilkar , LME, Second year students of MA Polytechnic, Nashik. It was arranged by Prof. Y. P. Jadhav.

- **Attended Webinar Series on National Technology Day celebrations: 2021 "Advance Technologies and Applications in Engineering"**
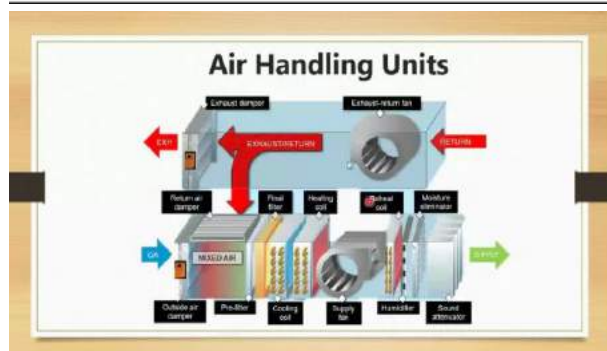 **(11th May 2021 to 14th May 2021)**

The Webinar Series on National Technology Day celebrations: 2021 "Advance Technologies and Applications in Engineering" had attended by Prof. M. S. Gaidhani. Webinar was organized by Indian Space Industry Exhibitors, Ghaziabad.

- **Attended Webinar on Opportunities for Youth in ISHRAE (25th May 2021)**

The Webinar on Opportunities for Youth in ISHRAE had attended by Third Year Students and Staff of Mechanical Engg. Webinar was organized by ISHRAE Chapter, Nashik. It was delivered by Mr. Ankur Mantri, Technical Committees of ISHRAE and Acting Program Chair, ISHRAE, Surat Chapter. The event was coordinated by Prof. K. V. Kushare.

Computer Department
- **Conducted Expert Lecture of Web Development (31st May 2021)**

Online Expert Lecture on Web Development under subject Web Based Application Development using PHP had organized and conducted by Computer Department for Third year students. Mr. Sanjay Navale, Industry Expert was delivered Lecture. The event was coordinated by Prof. P. D. Boraste.

E & TC Engineering Department
- **Attended Webinar on Basic of Patents (6th May 2021)**

The Webinar on Basic of Patents had attended by Prof. S. A. Suryawanshi. Webinar was organized by Sanjivani College of Engineering, Kopargaon. Mr. Vivek Daulatani, Lead IP Strategy Micelio Mobility Pvt. Ltd was delivered Lecture.

- **Organized Online Quiz on Rajarshi Shahu Maharaj Life and Entire Tenure (6th May 2021)**

Online Quiz on Rajarshi Shahu Maharaj Life and Entire Tenure had organized by EJ Department. The quiz was coordinated by Prof. S. A. Suryawanshi.

- **Conducted Guest Lecture on Information Theory & Coding Techniques (18th May 2021)**

Online Guest Lecture on Information Theory & Coding Techniques had

organized and conducted by EJ Department for Second and Third Year students. Prof. Bhushankumar Shinde, Asst. Professor, MVPS's KBTCOE, Nashik was delivered Lecture. The event was coordinated by Prof. P. G. Deshmukh.

Information Technology Department

- **Conducted Expert Lecture of Cloud Computing (5th May 2021)**

Online Expert Lecture on Cloud Computing had organized and conducted by Information Technology Department under INTECH Association for TYIF and TYEJ. Mr. Siddhant Dadel, Alumni, RSM Polytechnic, Nashik was delivered Lecture. The event was coordinated by Prof. V. K. Khedkar.

- **Conducted Expert Lecture on Data Science (8th May 2021)**

Online Expert Lecture on Emerging Trends in Information Technology had organized and conducted by Information Technology Department under INTECH Association for TYIF and TYEJ. Mr. Amit Lekurwale was delivered Lecture. The event was coordinated by Prof. A. P. Patil.

Online Expert Lecture on Data Science under subject Emerging Trends in Information Technology had organized and conducted by Information Technology Department under INTECH Association for TYCM and TYIF. Dr. MD Daoud, Data Scientist was delivered Lecture. The event was coordinated by Prof. V. K. Khedkar.

- **Conducted Expert Lecture on Guidelines for Publishing Papers (30th May 2021)**

- **Conducted Expert Lecture on Emerging Trends in Information Technology (15th May 2021)**

Online Expert Lecture on Guidelines for Publishing Papers had organized and conducted by Information Technology

Department INTECH Association. Prof. V. K. Khedkar, HOD IF, MVPS's RSM Polytechnic was delivered Lecture. The event was anchored by Prof. M. S. Gaidhani.

Electrical Engineering Department

- **Organized Virtual Industrial Visit to 33/11 KV Substation Amravati (25th May 2021)**
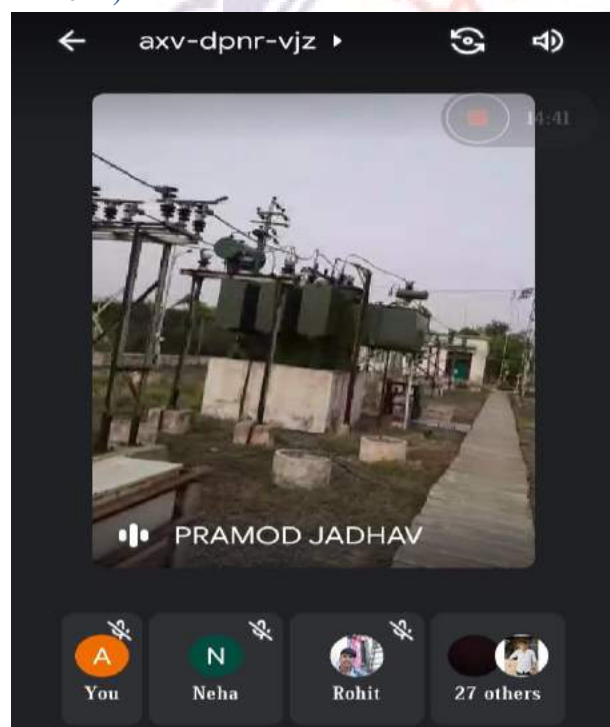
Virtual Industrial Visit was organized on subject Electrical Power Transmission and Distribution for Second Year students of Electrical Engineering Department at 33/11 KV Substation, Amravati by Prof. A. S. Parkhe. Session was guided by Mr. P. S. Jadhav, Junior Engineer, MAHADISCOM.

- **Conducted Expert Lecture on Solar Power System and Hybrid Electrical Vehicles (28th May 2021)**
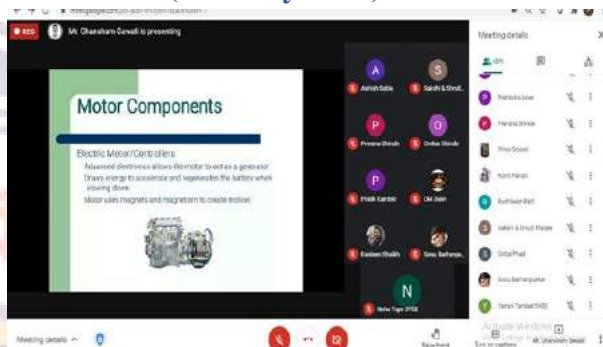
Online Expert Lecture on Solar Power System and Hybrid Electrical Vehicles under subject Industrial Measurement had organized for Second year students by Prof. P. A. Shinde of Electrical Engineering Department. It was guided by Mr. G. D. Gawali, Asst. Professor, COE Kashti.

Science and Humanity Department

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Trending Technology:

Robotic Exoskeletons

Robotic exoskeletons have emerged as rehabilitation tool that may ameliorate several of the existing health-related consequences after spinal cord injury (SCI). However, evidence to support its clinical application is still lacking considering their prohibitive cost. The current mini-review is written to highlight the main limitations and potential benefits of using exoskeletons in the rehabilitation of persons with SCI. We have recognized two main areas relevant to the design of exoskeletons and to their applications on major health consequences after SCI. The design prospective refers to safety concerns, fitting time and speed of exoskeletons. The health prospective refers to factors similar to body weight, physical activity, pressure injuries and bone health. Clinical trials are currently underway to address some of these limitations and to maximize the benefits in rehabilitation settings.

Different brands of powered exoskeletons are now commercially available for SCI rehabilitation with different levels of injury. However, there is still a

limited accessibility to exoskeletons in clinical settings, partly because of their prohibitive cost and the high level of training required before supervising individuals with SCI. Despite these limitations, limited research and anecdotal evidence support the use of exoskeleton to improve quality of life and health related medical conditions after SCI. Previous excellent reviews have summarized and highlighted the potential benefits of using exoskeleton for rehabilitation of persons with SCI. It is crucial before expanding the applications of exoskeletons that we carefully analyze the available research and clinical evidence regarding this technology. However, clinical trials are underway to confirm these benefits and to understand the underlying mechanisms that lead to such improvement. Clinical trials site (clinctrials.gov) indicated that out of 870 studies for SCIs, there are 28 studies (approximately 3%) addressing different applications of exoskeletons in this population. These statistics may highlight our limited knowledge and the need for additional clinical trials to address the major limitations of exoskeletons. The current use of robotic exoskeletons remains investigational and premature to decide whether exoskeletons are clinically effective in the rehabilitation of persons with SCI. The primary focus of the current review is to allow critical analysis of the available research evidence and to encourage interdisciplinary approach to advance the use of technology in clinical settings. The rehabilitation community should not be discouraged from the use of exoskeletons, but rather to procced with caution regarding their clinical applications. Moreover, the mini-review will provide the reader with the current pros and cons regarding exoskeletons and will summarize in a non-exhaustive manner the theoretic or potential benefits after recognizing the primary limitations of exoskeletons. It is not the intention of the current review to list types or characteristics of different exoskeletons that were recently published in details. The published work provided details on the average cost per unit and clear illustrations of different exoskeleton units available in rehabilitation settings.

Prof. Y. M. Halde
LME

Manufacturing Robots

Car manufacturing robots give automotive companies a competitive advantage. They improve quality and reduce warranty costs; increase capacity and relieve bottlenecks; and protect workers from dirty, difficult and dangerous jobs. Car assembly plants use robots exclusively for spot welding and painting, but there are many other opportunities to use robots throughout the supply chain.

Automotive Manufacturing Quality Gains

Car factory robots reduce part-to-part variability. Highly repeatable, they never tire or get distracted, so every cycle is performed the same way. Neither do they drop parts or handle them in a way that causes damage. That reduces waste previously caused by human error, which also means less variability in car assembly. Equipped with vision systems, automotive robots even can detect variation in incoming materials and adapt their programmed paths to suit. This, in turn, translates to higher customer satisfaction, fewer mistakes and lower warranty costs.

Addressing Manufacturing Capacity

Automotive supply chains run lean with minimal inventory to buffer against production delays. Automotive part manufacturers strive for consistent times and process control in every step of the production line. Even the smallest problem can stop an assembly line.

Protecting Workers

Many jobs in automotive manufacturing are hazardous. Sometimes, the dangers are obvious, as when pouring molten metal in a foundry. Other times, they're more insidious, like the musculoskeletal disorders resulting from lifting, twisting and repetitive motions. Robots can prevent these risks to humans. In car assembly, robots keep workers from exposure to fumes from welding and painting, as well as weld flash and the noise of stamping presses. Automotive robotics cut accidents and injury claims by removing workers from these dirty and dangerous tasks and environments.

Adding Flexibility

Automotive robots have three advantages over hard or dedicated automation:

Less Risk of Obsolescence. When a product line disappears, the robot can be redeployed with little additional or no cost. In contrast, hard automation usually ends up being scrapped.

The best-suited application areas:

Welding (SPOT AND ARC): Large robots with high payload capabilities and long reach can spot weld car body panels; while smaller robots weld subassemblies such as brackets and mounts. Robotic MIG and TIG arc welding position the torch in the same orientation on every cycle, and repeatable speed and arc gap ensure every fabrication is welded to the same high standard.

Assembly: Tasks such as screw driving, windshield installation and wheel mounting are all candidates for robotic arms in car manufacturing plants. In many automotive part plants, robots — for example, the high-speed "Delta" machines — are assembling smaller component assemblies such as pumps and motors.

Machine Tending: Unloading hot moldings from an injection molding or die casting machine, and loading and unloading CNC machining centers are all good examples of robots tending production machines.

Material Removal: Because it can follow a complex path repeatedly, a robot is an ideal tool for light trimming and cutting tasks. Examples include cutting fabrics. Technology lets the robot maintain constant pressure against a surface in applications like these.

Part Transfer: Pouring molten metal in a foundry and transferring a metal stamp from one press to the next are unpleasant jobs for human workers, but they're ideal robot tasks.

Mast. Yash D. Thombare
Student-TYME

5 Networking Trends for 2020

Networking got some serious attention in 2019 with the wide adoption of these capabilities.

Automation.
- Mission-critical cloud connectivity.
- Artificial intelligence and machine learning.
- 802.11ax for wireless networks.

As these seemingly disparate technologies mature and coalesce into integrated systems, I think we'll see digital transformation become more than a buzzword in the next decade. In fact, I believe it will revolutionize the way we work in very practical ways.

These are my top 5 networking trends for 2020.
1. Networking Will Become More Automated

Over the last few years, networking vendors released automation platforms to make managing networks easier. But until now, they've felt sort of like flowers not ready to bloom. There have been interoperability issues, feature parity issues and even cultural issues as the networking community opined if this was the end of the traditional network engineer.

As we enter 2020, I think we've finally reached the

point when we'll see automation blossom into the dominant way to manage networks going forward. Though homegrown automation is still popular in the Reddit threads and blogosphere, watch out for vendors incorporating automation into their platforms—not as just another feature, but as the baseline for how to operate networks.

I believe we'll see more one-click network deployments for the WAN, campus and data center, similar to how we already see it with the public cloud providers. I don't think this means the end of the traditional network engineer. But it does mean we'll see more collaboration between networking and applications teams.

In the coming year, the conversation about whether or not traditional network engineers will be out of a job is going to change, too. We spent 2019 discussing whether

engineers need to abandon learning OSPF in favor of learning Python. It took time to flesh out this new paradigm, and I think we've finally settled on a conclusion.

2. 5G and Wi-Fi 6 Will Make Their Way into Our Homes and Offices

There will be a 5G versus Wi-Fi 6 battle for home and business use next year. Now, I know this isn't exactly a trend per say, but it's nevertheless an important thing to watch for in the coming year.

Cellular providers have an opportunity to make good on their promises to bring 5G right into our homes and offices with personal 5G cellular networks. I realize this was promised a long time ago, and it took years for ISPs to finally coalesce around a common 5G communications language. In 2020, we'll see ISPs rally behind 5G NR and make a push to move from large-scale connectivity to small scale in our offices and homes.

This could help solve the challenge of having so many wireless devices connected at once—a problem IoT makes worse—by slowing wireless network performance even more. However, Wi-Fi 6 promises to solve the same problem as 5G and has much easier inroads into the market, which is why I'm not sure 5G from large ISPs will win out in the fight over small-scale wireless networking. Pay attention to how ISPs approach this new market niche in 2020.

Why Wi-Fi 6? In the second half of 2019, 802.11ax (better known as Wi-Fi 6) boomed. Networking vendors rushed to release new access points, wireless controllers and marketing initiatives. Now, Wi-Fi 6 infrastructure is ready to go, but devices, such as phones, laptops and other Wi-Fi-capable device chipsets, weren't there until very recently.

So in 2020, I predict we'll see the widespread proliferation of Wi-Fi 6-capable devices as computer and cellphone manufacturers move to the new standard. This is a good thing. Because both at home and at the office, Wi-Fi 6 will solve a real problem, and people be happy to take advantage of it, everywhere.

3. AI and ML Will Lead to Autonomous Networks

Analyzing data with machine learning (ML) algorithms and artificial intelligence (AI) will become the common starting point for many technologies. ML can make predictions based on network data. And in the broader sense, AI can take intelligent action based on those predictions.

In 2020, analytics tools built on ML and AI will get better and more powerful. Instead of being yet another management platform no one logs into, they'll be built right into networking platforms.

That doesn't mean routers and switches will be doing network analysis for us. Remember we're also seeing a trend toward completely automated networks managed by some sort of controller. I believe advanced analytics will be baked right into these automation platforms, which will evolve into validation mechanisms and the beginnings of a self-operating network.

I don't think we'll see completely autonomous networks in 2020. But I do think we'll see advanced analytics and automation—major components of intent-based networking—become so common that we'll discuss self-remediation as the very real next step in software-defined networking.

Miss. Nikita Keshav Walke
Student, SYCM

10 Cyber Security Trends for 2021

With the digital revolution around all businesses, small or large corporates, organizations, and even governments are relying on computerized systems to manage their day-to-day activities

and thus making cybersecurity a primary goal to safeguard data from various online attacks or any unauthorized access. Continuous change in technologies also implies a parallel shift in cybersecurity trends as news of data breach, ransomware, and hacks become the norm. Here are the top cyber security trends for 2021 that we will cover in detail, including:

- Automotive hacking
- Integrating AI with cyber security
- Mobile: the new target
- Cloud vulnerability
- Data breaches
- IoT with 5G networks
- Automation and integration
- Targeted ransomware
- Cyber warfare
- Other insider threats

1) Rise of Automotive Hacking

The first cyber security trend in 2021 is going to be the rise of automotive hacking. Modern vehicles nowadays come packed with automated software creating seamless connectivity for drivers in cruise control, engine timing, door lock, airbags, and advanced systems for driver assistance. These vehicles use Bluetooth and WiFi technologies to communicate, which also opens them to several vulnerabilities or threats from hackers. Gaining control of the vehicle or using microphones for eavesdropping is expected to rise in 2021 with more use of automated vehicles. Self-driving or autonomous vehicles use an even further complex mechanism that requires strict cybersecurity measures.

2) Integrating AI with Cyber Security

With AI being introduced in all market segments, this technology with a combination of machine learning has brought tremendous changes in cybersecurity. AI has been paramount in building automated security systems, natural language processing, face detection, and automatic threat detection. Although it is also being used to develop smart malware and attacks to bypass the latest security protocols in controlling data. AI-enabled threat detection systems can predict new attacks and notify admins for any data breach instantly, making it the next cyber security trend in 2021.

3) Mobile is the New Target

Cybersecurity trends provide a considerable increase (50 percent) for mobile banking malware or attacks in 2019, making our handheld devices a potential prospect for hackers. All our photos, financial transactions, emails, and messages possess more threats to individuals. Smartphone's virus or malware may capture the attention of cybersecurity trends in 2021.

4) Cloud is Also Potentially Vulnerable

With more and more organizations now established on clouds, security measures need to be continuously monitored and updated to safeguard the data from leaks. Although cloud applications such as Google or Microsoft are well equipped with security from their end still, it's the user end that acts as a significant source for erroneous errors, malicious software, and phishing attacks.

5) Data Breaches: Prime target

Data will continue to be a leading concern for organizations around the world. Whether it be for an individual or organization, safeguarding digital data is the primary goal now. Any minor flaw or bug in your system browser or software is a potential vulnerability for hackers to access personal information. New strict measures General Data Protection Regulation (GDPR) was enforced from May 25th, 2018 onwards, offering data protection and privacy for individuals in the European Union(EU). Similarly, the California Consumer Privacy Act (CCPA) was applied after January 1st, 2020, for safeguarding consumer rights in the California area

6) IoT with 5G Network: The New Era of Technology and Risks

Next raging cyber security trend for 2021 is the IoT with 5G networks. With 5G networks expected to roll out in 2020 globally, a new era of inter-connectivity will become a reality with the Internet of Things (IoT). This communication between multiple devices also opens them to vulnerabilities from outside influence, attacks, or an unknown software bug. Even the world's most used browser supported by Google Chrome was found to have serious flaws. 5G architecture is still effectively new in the industry and requires a lot of research to find loopholes to make the system secure from external attack. Every step of the 5G network might bring a plethora of network attacks that we might not be aware of. Here manufacturers need to be very strict in building sophisticated 5G hardware and software to control data breaches.

7) Automation and Integration

Here's the next cyber security trend - with the size of data multiplying every day, it is eminent that automation is integrated to give more sophisticated control over the information. Modern hectic work demand also pressurizes professionals and engineers to deliver quick and proficient solutions, making automation more valuable than ever. Security measurements are incorporated during the agile process to build more secure software in every aspect.

8) Targeted Ransomware

Another significant trend in cybersecurity is that we can't seem to ignore for 2020 is targeted ransomware. Especially in the developed nation's industries rely heavily on specific software to run their daily activities. These ransomware targets are more focussed, such as the Wanna Cry attack on the National Health Service hospitals in England Scotland corrupted more than 70,000 medical devices. Though generally, ransomware asks to threaten to publish victim's data unless a ransom is paid still, it can affect the large organization or in case of nations too.

9) State-Sponsored Cyber Warfare

There won't be any stoppage between the western and eastern powers in attempts to find superiority. The tension between the US and Iran or Chinese hackers often creates worldwide news though the attacks are few; they have a significant impact on an event such as elections. And with more than 70 elections bound to be held this year, criminal activities during this time will surge. Expect high-profile data breaches, political and industrial secrets to top cyber security trends for 2021.

10) Insider Threats

Human error is still one of the primary reasons for the data breach. Any bad day or intentional loophole can bring down a whole organization with millions of stolen data. Report by Verizon in data breach gives strategic insights on cybersecurity trends that the employees directly or indirectly made 34 percent of total attacks. So make sure you create more awareness within premises to safeguard data in every way possible.

Prof. P. N. Patil
LCM

Flexible-printed circuit technology

Flexible-printed circuit technology has a well-established history that goes back nearly one Hundred years. However, its commercial use is prominently observed within the last few decades, the advance of electronic systems is evidence of a major digital technology revolution. Today our homes with cordless phones and digital TVs, cars equipped with Hands-free communications and telematics, and business world with notebook computers and mobile personal data assistants (PDAs) need to replace costly and increasingly complicated wired assemblies. This has become possible due to the flexible circuits which offer

Maratha Vidya Prasarak Samaj's
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a much simpler and more cost-effective interconnection method. Flexible circuits provide enormous design freedoms for electronic engineers and product designers. As the demands of modern electronic systems call for increasing functionality, greater circuit density, higher Connectivity, better environmental performance, and all at lower cost, flexible circuitry can be the ultimate answer for the twenty-first century electronics. The heart of FPC is the flexible PCBs which comprise films and thin layers of conductive Circuit traces. Basic material elements that constitute a flexible PCB are a dielectric substrate Film (base material), adhesives to bond the various materials together, electrical conductors (circuit traces), and a protective coating (cover lay or cover coat). Together the above Materials form a basic flexible-circuit laminate suitable for use as a simple wiring assembly.

Types of Flexible-Circuit Construction
(Many of the flexible circuits follow six basic designs.)

1. Single-Sided Flexible Circuits
2. Rigid-Flex Circuits
3. Multilayer Flex Circuits
4. Sculptured Flex
5. Double-Sided Flex Circuits
6. Double Access Flexible Circuits
   Applications of Flexible printed circuit technology.
1. Thin and light LED products
2. Smart phones and tablet PCs
3. Automotive PCB
4. Component embedded PCB
5. RFID products
6. CSP (chip-scale package) technology
7. Space Electronics Circuits

**Prof. N. A. Gade,
LEJ**

A Digital Factory

A digital factory uses digital technology for modeling, communications and to operate the manufacturing process. This arrangement of technology allows managers to configure, model, simulate, assess and evaluate items, procedures and system before the factory is constructed. The digital factory gives answers for configuration, design, screen and control of a production system. It adopts the combination of physical technology and cyber technology and deeply integrates previously independent discrete systems making the involved technologies more complex and precise than they are now. In the implementation of digital factory, the Industrial Internet of Things (IIoT) is employed to integrate the underlying equipment resources. Accordingly, the manufacturing system has abilities of perception, interconnection and data integration. The data analysis and scientific decision are used to achieve production scheduling, equipment service and quality control of products in digital factory. Further, the Internet of services is introduced to virtualize the manufacturing resources from a local database to the cloud server. Through the Human-Machine interaction, the global collaborative process of intelligent manufacturing oriented to the order-driven market is built. Therefore, the digital factory represents an engineering system that mainly consists of three aspects: interconnection, collaboration and execution. The Main aim of digital factory is to convert modern factory into smart factory.

The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. Things: A thing, in the context of the IoT is an entity or physical object that has a unique identifier, an embedded system and the ability to transfer data over a network. Things can be a part of domestic, process or manufacturing areas like smart TV, PLC, CNC machine etc.IoT evolved from machine-to-machine (M2M) communication, i.e., machines connecting to Each other via a network without human interaction. M2M refers to connecting a device to the Cloud, managing it and collecting data. Taking M2M to the next level, IoT is a sensor network of billions of smart devices that connect people, systems and other applications to collect and share data. As its foundation, M2M offers the connectivity that enables IoT.

**Mast. Umair Ahmad Khan,
Student, TYEJ**

Network security

Network security is a broad term that covers a multitude of technologies, devices and processes. In its simplest term, it is a set of rules and configurations designed to protect the integrity, confidentiality and accessibility of computer networks and data using both software and hardware technologies. Every organization, regardless of size, industry or infrastructure, requires a degree of network security solutions in place to protect it from the ever-growing landscape of cyber threats in the wild today.

Today's network architecture is complex and is faced with a threat environment that is always changing and attackers that are always trying to find and exploit vulnerabilities. These vulnerabilities can exist in a broad number of areas, including devices, data, applications, users and locations. For this reason, there are many network security management tools and applications in use today that address individual threats and exploits and also regulatory non-compliance.

Types of Network security
- Access control.
- Antivirus and anti-malware software
- Application security
- Behavioural analytics
- Data loss prevention
- Distributed denial of service prevention
- Email security
- Firewall

What is the history of the Network security?
Since the inception of networked computers, network security has been a concern. Before the 90s, networks were relatively uncommon and the general public was not made-up of heavy internet users. During these times, security was not as critical - however, with more and more sensitive information being placed on networks, it would grow in importance. During the 70s and 80s, researchers with access to the "internet" enjoyed playing practical jokes on each other through the network. These jokes were harmless, but nonetheless, exposed flaws in the security of the ARPANET (forerunner to today's internet).

Ms. Bhumi S. Sonawane
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Bitcoins mining

Chances are you hear the phrase "bitcoin mining" and your mind begins to wander to the Western fantasy of pickaxes, dirt and striking it rich. As it turns out, that analogy isn't too far off. Bitcoin mining is performed by high-powered computers that solve complex computational math problems; these problems are so complex that they cannot be solved by hand and are complicated enough to tax even incredibly powerful computers.

The result of bitcoin mining is twofold. First, when computers solve these complex math problems on the bitcoin network, they produce new bitcoin (not unlike when a mining operation extracts gold from the ground). And second, by solving computational math problems, bitcoin miners make the bitcoin payment network trustworthy and secure by verifying its transaction information.

What is an application of a Bitcoins mining?
Bitcoins are being used to buy goods and services as more and more stores across the world are accepting bitcoin payments. Bitcoin transactions provide a customized level of anonymity and it is relatively difficult to trace their trail. So bitcoins are being used to transact anonymously. International payments can be made easily and cheaply as bitcoins are not related to any country or subject to any government regulation. There is the freedom of the fact that there is no need of permission from any authority for your transactions.

What is the history of the Bitcoins mining?
Nakamoto implemented the bitcoin software as open-source code and released it in January 2009 Nakamoto's identity remains unknown.

On 3 January 2009, the bitcoin network was created when Nakamoto mined the starting block of the chain, known as the genesis block. Embedded in the coin base of this block was the text "The Times 03/Jan/2009 Chancellor on brink of second bailout for banks This note references a headline published by The Times and has been interpreted as both a timestamp and a comment on the instability caused by fractional-reserve banking.

Mrs. R. V. Shinde
TAIF

Design and Imp

Lamentation of Smart Energy Meter Electricity is one of the fundamental necessities of human beings, which is commonly used for domestic, industrial and agricultural purposes. Power theft is the biggest problem in recent days which causes lot of loss to electricity boards. In countries like India, these situations are more often. If we can prevent these thefts we can save lot of power. This is done using Smart Energy Meter (SEM). SEM is an electric device having energy meter chip for measuring the electric energy consumed and a wireless protocol for data communication. The main feature of Smart energy meters (SEM) is to send precise reading on a regular

interval to utility (Electricity provider). So the bills will be accurate and labor cost is reduced using AMR (automatic meter reading). If the consumer is unable to pay the electricity bill within billing time, the Electricity provider can remotely disconnect the supply of that consumer and after payment, the service continues to the consumer. In such situation no human intervention needed to cut power supply from the grid and again to reconnect their connection.

We added the smart mechanism to detect tampering attempt. When anyone try to open or temper the meter the small switch will release and send alert to the utility. If power quality of supply (such as overvoltage, under voltage) is not in standard limit, then the customer devices can be protected by disconnecting and reconnecting to the mains power supply.

Ms. S. S. Sangamnere,
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Solar Powered Vaccine Storage Refrigerator

In many developing nations electricity is not available in remote places from the grid. This is a challenge which risks the sustainability of the cold chain of vaccines storage. The only choices available for several years to electrically powered refrigerators are kerosene and gas-driven refrigerators. they are also plagued by outages in gas supply, lower efficiency, poor temperature control and need regular servicing. In stage 2 Traditional battery powered refrigerators are coming but they are worked on comparatively expensive battery, which have observed short life. Solar refrigeration was a promising development in the early 1980s, providing an alternative to absorption technology to meet cold chain needs in remote areas. Devices generally had strong laboratory performance data; however, experience in the field over the years has been mixed. Traditional solar refrigerators relied on relatively expensive battery systems, which have demonstrated short lives compared to the refrigerator. There are now alternatives to the battery-based systems and a clear understanding that solar refrigerator systems need to be designed, installed, and maintained by technicians with the necessary knowledge and training. Thus, the technology is now poised to be the refrigeration method of choice for the cold chain in areas with no electricity or extremely unreliable electricity (less than 4 h per average day) and sufficient sunlight. To overcome all this problems, we are going to design this solar based electrical project which saves life of poor community in remotely located community.

The Solar Vaccine Refrigerator maintains a constant temperature suitable for vaccine storage in rural health clinics. The photovoltaic modules convert sunlight directly into electricity, powering the compressor of the vaccine refrigerator. Rechargeable batteries are used to store electric energy. The charge controller regulates the flow of electricity to protect the batteries from overcharging and over-discharging.

Ms. Shruti Matale,
Student, SYEE

Artificial Intelligence (AI) and Machine Learning

Artificial Intelligence, or AI, has already received a lot of buzz in the past decade, but it continues to be one of the new technology trends because of its notable effects on how we live, work and play are only in the early stages. AI is already known for its superiority in image and speech recognition, navigation apps, smartphone personal assistants, ride-sharing apps and so much more.
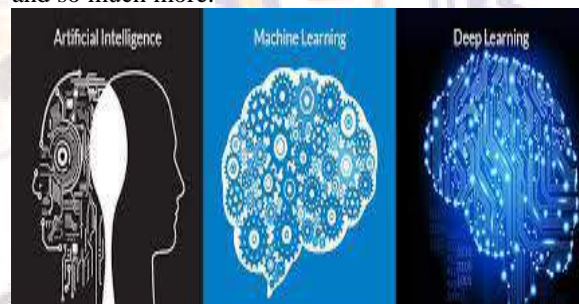
Other than that AI will be used further to analyze interactions to determine underlying connections and insights, to help predict demand for services like hospitals enabling authorities to make better decisions about resource utilization, and to detect the changing patterns of customer behavior by analyzing data in near real-time, driving revenues and enhancing personalized experiences.
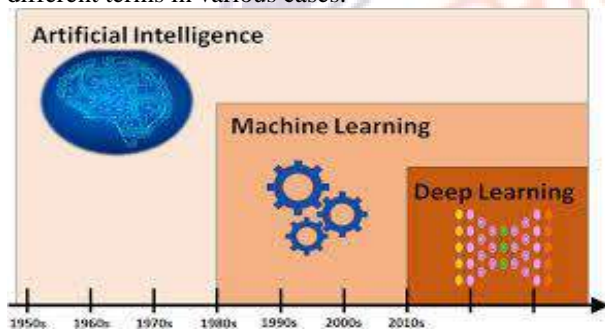
Machine Learning the subset of AI, is also being deployed in all kinds of industries, creating a huge demand skilled professionals. Forrester predicts AI, machine learning, and automation will create 9 percent of new U.S. jobs by 2025, jobs including robot monitoring professionals, data scientists, automation specialists, and content curators, making it another new technology trend you must keep in mind too!

On a broad level, we can differentiate both AI and ML as: AI is a bigger concept to create intelligent machines that can simulate human thinking capability and behavior, whereas, machine learning is an application or subset of AI that

allows machines to learn from data without being programmed explicitly.

Difference between Artificial intelligence and Machine learning: Artificial intelligence and machine learning are the part of computer science that are correlated with each other. These two technologies are the most trending technologies which are used for creating intelligent systems. Although these are two related technologies and sometimes people use them as a synonym for each other, but still both are the two different terms in various cases.

AI is a bigger concept to create intelligent machines that can simulate human thinking capability and behavior, whereas, machine learning is an application or subset of AI that allows machines to learn from data without being programmed explicitly.

Prof. S. P. Jagtap.
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Optical Fibre Communication

Optical Fibre:
Fiber-optic communication is a method of transmitting information from one place to another by sending pulses of infrared light through an optical fiber. The light is a form of carrier wave that is modulated to carry information. Fiber is preferred over electrical cabling when high bandwidth, long distance, or immunity to electromagnetic interference is required. This type

of
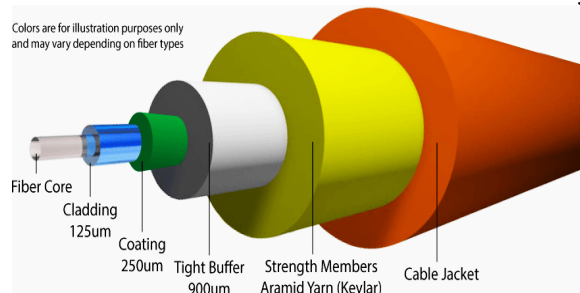
communication can transmit voice, video, and telemetry through local area networks or across long distances.

Optical fiber is used by many telecommunications companies to transmit telephone signals, Internet communication, and cable television signals. Fibre optic cables are cables that contain several thousands of optical fibres in a protective, insulated jacket. The optical fibres are very thin strands of pure glass, which transmit information in the form of light. Fibre optic cables have revolutionized the world of network communication ever since their inception nearly four decades ago. Today, these cables have almost obliterated traditional methods of networking, which use metallic wires. Some of the most popular uses of fibre optic cables are listed below.

1) Internet: -
Fibre optic cables transmit large amounts of data at very high speeds. This technology is therefore widely used in internet cables. As compared to traditional copper wires, fibre optic cables are less bulky, lighter, more flexible, and carry more data.

2) Computer Networking: -
Networking between computers in a single building or across nearby structures is made easier and faster with the use of fibre optic cables. Users can see a marked decrease in the time it takes to transfer files and information across networks

3) Surgery and Dentistry: -
Fibre optic cables are widely used in the fields of medicine and research. Optical communication is an important part of non-intrusive surgical methods, popularly known as endoscopy. In such applications, a minute, bright light is used to light up the surgery area within the body, making it possible to reduce the number and size of incisions made. Fibre optics are also used in microscopy and biomedical research.

4) Automotive Industry: -
Fibre optic cables play an important role in the lighting and safety features of present-day automobiles. They are widely used in lighting, both in the interior and exterior of vehicles. Because of its ability to conserve space and provide superior lighting, fibre optics are used in more vehicles every day. Also, fibre optic cables can transmit signals between different parts of the vehicle at lightning speed.

5) Telephone: -
Calling telephones within or outside the country has never been so easy. With the use of fibre optic communication.

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Happy
महाराष्ट्र दिन, International Labour Day, Mother's Day, National Technology Day, International Day of Families
Armed Forces Day and World Telecommunication Day to All Readers
on the behalf of
Principal, Faculty, Supporting Staff and Students.

Dr. D. B. Uphade
Principal