ACS College of Engineering
Approved by AICTE New Delhi, Affiliated to VTU, Belagavi
(A Unit of RajaRajeswari Group of Institutions)

NAAC 'A' Accredited

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

AICTE Sponsored
6 Days Short Term Training Programme
on
INDUSTRY 4.0 – Fourth Industrial Revolution
(19-10-2020 to 24-10-2020)

ABOUT ACSCE

ACS College of Engineering (ACSCE) was established in 2009, under the banner of Moogambigai Educational and Charitable Trust which was founded by Dr.A.C.Shanmugam. ACSCE is approved by AICTE New Delhi, Government of Karnataka, and affiliated to VTU Belagavi. Happy to inform that we are **NAAC accredited with 'A' grade** and **NBA accredited** for all our Programs. The institute offers UG, PG & Ph.D Courses in all major fields of Engineering. The institute is also actively engaged in heading various Research Projects and other development activities which is supported by branches like Aeronautical Engineering, Aerospace Engineering, Bio-Medical Engineering, Civil Engineering, Computer Science and Engineering, Electronics and Communication Engineering, Mechanical Engineering.

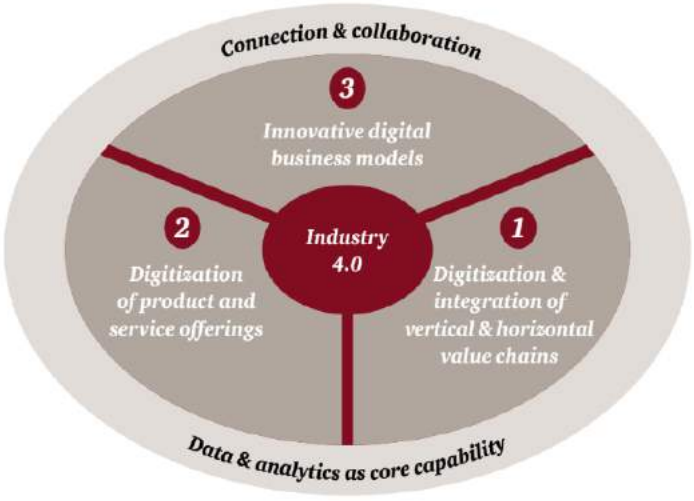
ABOUT ECE DEPARTMENT

The Department started in 2009 with an intake of 60.The Department offers UG, PG and PhD programmes. The department of Electronics and Communication Engineering is accredited by NBA and NAAC with 'A' grade. The Department has an outstanding track record and has consistently intended to create Electronics & Communication Engineering graduates of exceptional quality and caliber. The Department has highly qualified, experienced and committed faculty members. The Department is self-sustained with state of Art laboratories, software and volumes of books.

ABOUT THE STTP

Fourth industrial revolution -Industry 4.0 is a blend of Advanced Analytics, Big Data, Robotics & Automation, Artificial Intelligence, Internet of Things and Process Digitization. Industry 4.0 plays an important role in manufacturing and engineering sectors, automotive and process industries, as well as the electronics and electrical systems along with information & communications industries, an technology that aims on interconnectivity, automation, machine learning, and real-time monitoring among the machines and processes.

The fourth industrial revolution plays an important role in making long-term manufacturing efficiency possible. The industrial sector is required to produce ever larger quantities using fewer raw materials and less energy. Industry 4.0 will help companies create efficient manufacturing processes with increased production, energy and resource efficiency. The fourth industrial revolution has been characterized by the increasing digitization and interconnection of products, value chains and business models .



Digitization is finding its way into horizontal as well as vertical value chains to an equal extent. Digitization and greater connectivity in process organization may permit areas of work to be rationalized and may yield gains in productivity. The intelligent analysis and integrated use of data for controlling purposes also reduces the rejection rate in production.

OBJECTIVE OF STTP

The main objective of conducting STTP is to fill the gap between industry and academics and to transfer Knowledge by imparting quality training (Both theory and Hands on) to participants. The course will be handled by industry experts from top companies only.

RESOURCE PERSONS

Jagadeesh Maiya, President – Engineering Endurance International Group, Bangalore.

Mr. Yash N N, Global Technical Marketing Leader, Aruba, a Hewlett Packard Enterprise Company.

Mr. Kalyan Ram B, CEO, Electrono Solutions.

Dr.M.A.Kumar., Industry Principal, Infosys.

Mr. Mallikarjun Sharma, Chief IT Architect, Electrono Solutions.

Mr. Lux Rao, Senior Director & Head – Solutions, NTT, India.

Mr.Anish Pandari, Product Development Head, Electrono Solutions.

Mr.Sreekanth B Aradhya, Chief Expert, Robert Bosch Engineering & Business Solutions Pvt. Ltd,B'lore .

S.ArunKumar, Research Director, Electrono Solutions.

Note:

Experts from industry and their Teaching sessions for "industry 4.0" was fixed, which was supported by lab sessions. Thus, for all the four sessions, we had the Experts fixed and had different audience.

TOPIC OF THE SESSIONS (Theory & Lab)

- Challenges of implementing 4.0 mainly from social and Organizational Perspective.
- Human Challenges for making a smooth transition to 4.0 & beyond.
- Digital Transformation 3.0 to 4.0" - Introduction to Industry 4.0,Digital Transformation from Industry 3.0 to 4.0 ,Challenges and Digital Solution of Industry 1.0, 2.0, 3.0, Summary of Industry 4.0, Practical Use cases 4.0 and beyond.
- Need for Industry 4.0, Industry 4.0 Adoption across Various Sectors ,
- Industry 4.0 and Opportunities in Health care and Pharma.
- Data Validation & Analytics.
- Industry 4.0 across 3 domains: "The Origin" - Evolution of industry to its current state of 4.0, "The Applicability" - Application of technology in the Industry – Use cases, "Keeping it Real"- Experiential knowledge with real life case studies
- Key trending technologies and their use cases for Industry4.0--AR/VR, 5G, Blockchain, etc
- Along with Hands on session using Cloud software central. (four afternoon sessions).

CHIEF PATRON

Dr. A. C. Shanmugam
B.A. LLB, FIMSA, FRCPS (Glasgow, UK)
Founder Chancellor & Chairman,
RajaRajeswari Group of Institutions

CO-PATRON

Er. A. C. S. Arun Kumar
B.Tech (Hons)., LMISTE.,MIET.,(UK)., LMCSI.,
President, RajaRajeswari Group of Institutions

PATRONS

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Prof. Dr. S.Jeyabalan., M.E., MBA, Ph.D, Special Officer, RRGI
Dr. T R Gopalakrishnan Nair, Ph.D,Rector, RRGI

CHIEF CONVENER

Dr. M. S. Murali, Ph.D, , ACSCE

PROGRAMME COORDINATOR

Dr. H.B.Bhuvaneswari, Professor & Head, ECE, ACSCE

ORGANIZING TEAM

Dr. A.M. Prasannakumar, Professor, ECE, ACSCE
Mrs. Bharathi Gururaj, Assistant Professor, ECE, ACSCE
Mr. Nagesh. H. B, Assistant Professor, ECE, ACSCE
Mrs. Vijaya Dalawai, Assistant Professor, ECE, ACSCE
Mr. Prajith Prakash Nair, Assistant Professor, ECE ACSCE

WHO ATTENDED THE EVENT.

Faculty members from AICTE approved Institutions and Industry Persons (limited to 4 only from a strength of 40)

REGISTRATION

No registration fee. The participants were selected on First Come First Serve basis. E Certificates will be issued to the registered participants upon successful completion of the programme.

HOW TO APPLY

The interested participants were asked to apply through https://forms.gle/yrhX33SKMPRV4fxS9 google forms for all four sessions and deadline were given as mentioned below. The certificates were issued to only those participants who had attended all the session and gave feedback regularly and finally attended quiz.

No of participants who registered for the Programme was **409.**

Session	**Duration of Six days STTP**	**Selected participants were intimated before**	**No of participants who had Registered and participated in the event**	**No of participants who received e-Certificate.**
I	19/10/2020 to 24/10/2020	16/10/2020	63	44
II	9/11/2020 to 14/11/2020	07/11/2020	50	32
III	23/11/2020 to 28/11/2020	21/11/2020	58	36
IV	7/12/2020 to 12/12/2020	05/12/2020	50	33
Total No of Participants for all four sessions			**221**	**145**

VENUE : **LICENSED ZOOM ONLINE PLATFORM.**

Short Term Training Program (STTP) intends to conduct faculty trainings through financial assistance from AICTE to enable faculty members in the field of technical education to introspect and learn techniques that can help prepare students for active and successful participants in a knowledge society.

The Six day online Short Term Training Programme (STTP) on "**Industry 4.0**" was sponsored by AICTE and was conducted by the Department of Electronics and Communication Engineering of ACS College of Engineering ,Bengaluru.

All the four conclaves were inaugurated on day one - First session scheduled at 10 am. This training program was open to faculty members and industry professionals. The aim of this training program was to give exposure about Industry 4.0 and its adoption to various sectors, opportunities as well as real time case studies on health care, data validation, 5G technology and block chain along with hands on experience etc..

Around **409** participants had registered online for this program using Google forms. **50-63** members were selected from the registered candidates for the conclaves under first come first serve basis.

Finally, at the end of Six days programme, e-Certificates were issued to the participants based on attendance, feedback and final quiz. Study materials were issued in the form of CD/DVD to interested **143** participants who received the certificates.

INAUGURATION

All the four program were anchored by Dr. H.B.Bhuvaneswari,HOD,Department of Electronics and Communication , ACS College of Engineering, Bangalore.

Invocation Song was sung by Dr. Sneha Yeshwant, Hemanth kumar and Chaitanya respectively for all our four sessions.

Mrs. Bharathi Gururaj, Assistant Professor, dept of ECE, ACSCE gave a brief report on the participants registered for the programme. The participants were from reputed colleges/ Universities like; IIT Kanpur, IIT Guwahati, NIT Goa, Central University Of Jharkhand,

REVA University Bangalore, Dayanand Sagar University Bangalore, Vellore Institute of Technology Chennai, Kashmir University, Vidya Sagar University, West Bengal, North Eastern Hill University ,Meghalaya, Bhimara University … etc.

Industry participants were from but not limited to companies such as Infosys, CTS, Discover adventures, Bosch, Accenture and Ervalite.

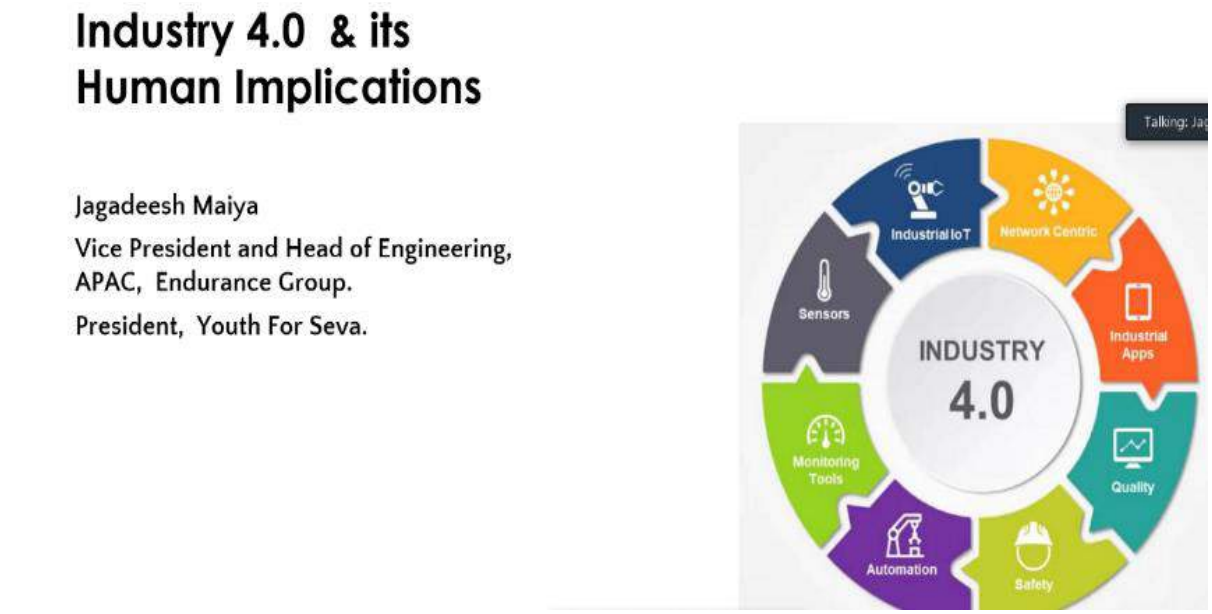
Dr.M.S.Murali, Principal, ACS College of Engineering, welcomed the participants and declared the program open. The Program was divided into two sessions: one in the morning and other in the afternoon.

The first morning sessions of all conclaves was started by the Chief Guest Mr.Jagadeesh Maiya, Vice President and Head of Engineering, Endurance Group.

Key notes address by :

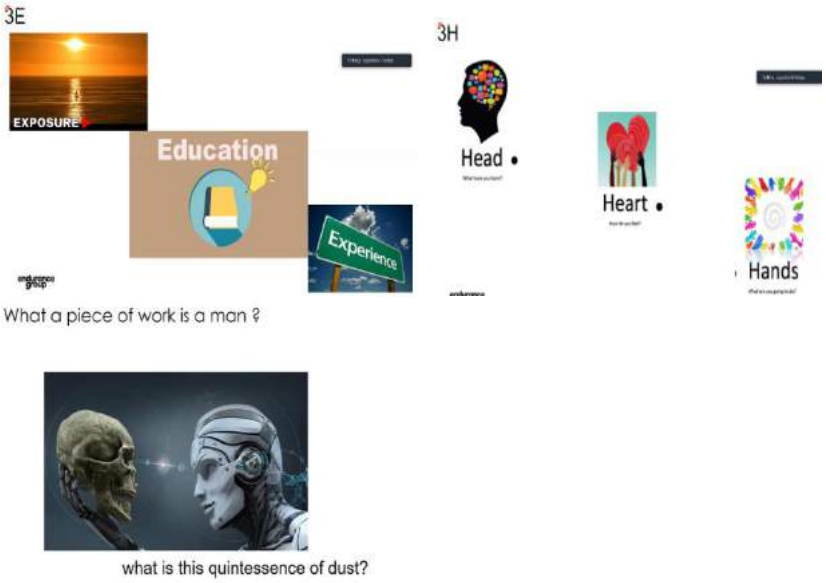
Mr. Jagadeesh Maiya
Vice-president
Endurance Group &
President, Youth for Seva

Samples of their ppt along with a brief report on each session.

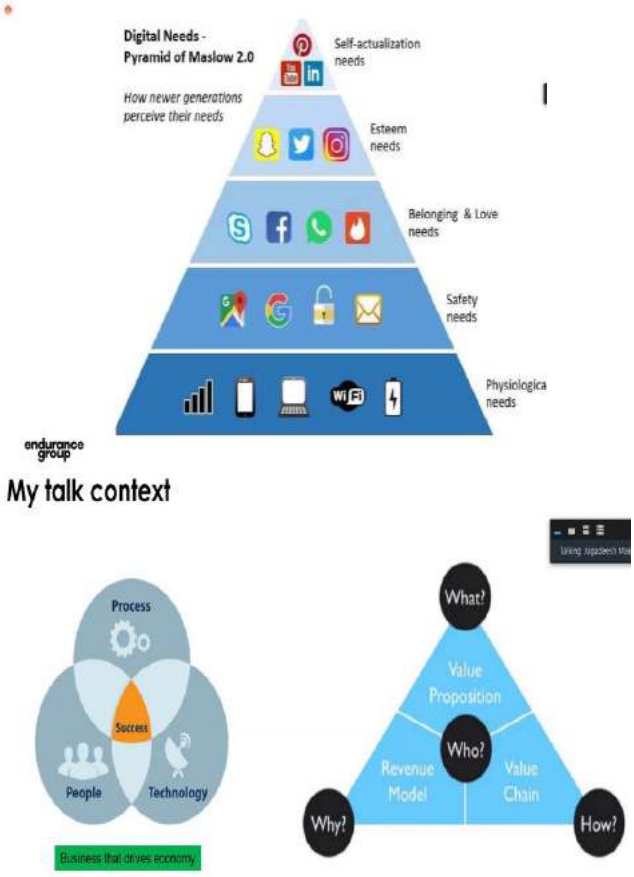


The morning session of the first day of the STTP was delivered by the chief guest of the day Mr.Jagadeesh Maiya. Mr.Maiya is the VP and Head of Engineering at APAC, Endurance International Group and is also the President of NGO- Youth for Seva. He obtained his Bachelor's Degree in Computer Science Engineering from National Institute of Engineering, Mysore in 1993. He is at present leading global software team providing web solutions, and worked in CISCO for nearly 2 decades in both United States and Bangalore. He is also the founder of Yoga Bharatiya.

Mr.Maiya started his session with an introduction on Industrial Revolution 4.0, its trends as well as his own tryst with the industry including the transformations occurring in companies like Siemens, Philips, GE, Bosch and NTT. The content of his speech was based on People, Process and Technology that finally leads to success. He spoke about the 3 E's – Exposure, Education and Experience, 3 H's- Head, Hands and Heart, 3 P's- Purpose, Passion and Possible.



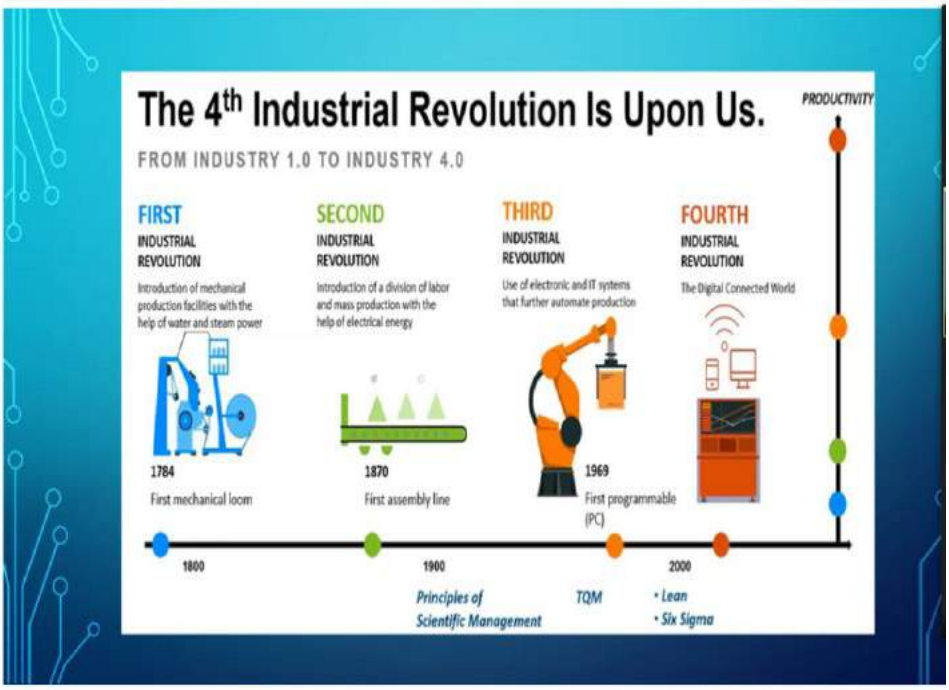
The concept of Pyramid of Digital Needs of Maslow



- Challenges of 4.0 from Human Perceptive and Organizational Perspective was discussed w.r.t :
  - Economic
  - Social
  - Political

- Consequences of Industry 4.0 on Human Labour and Work organization was also touched upon.

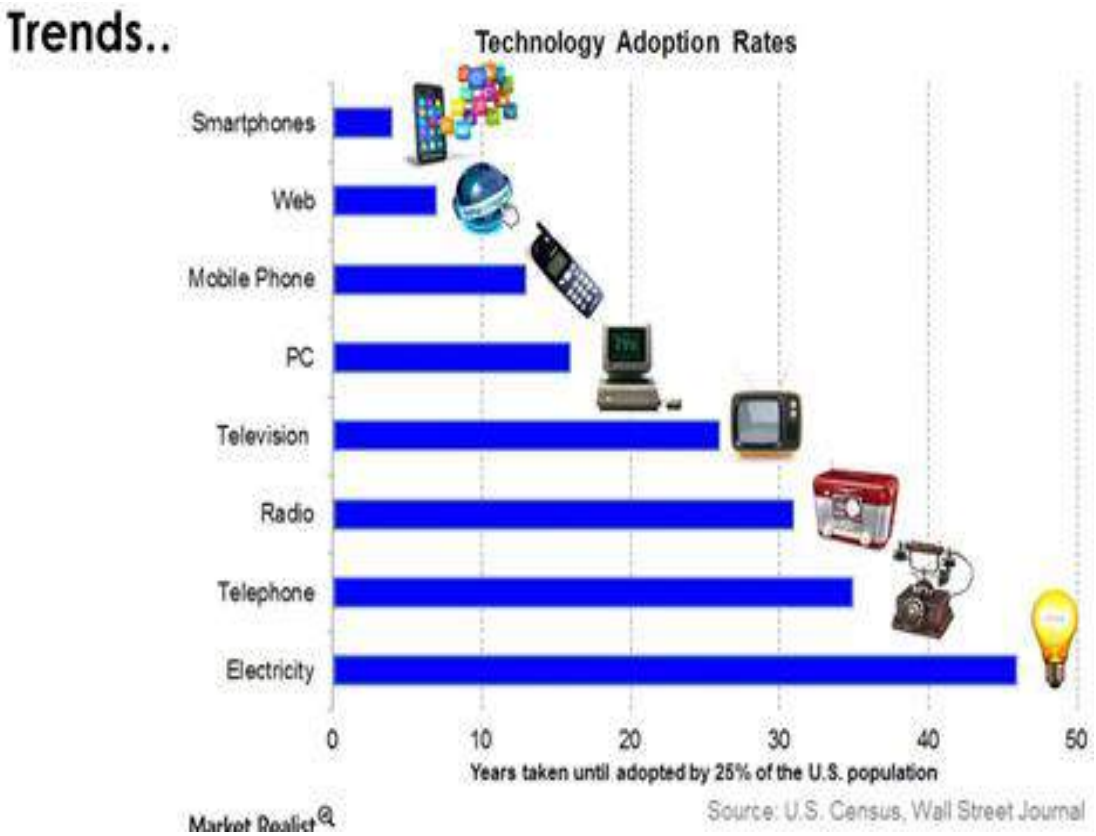
The big picture…



- He added to say that "Journey of a Leader was to Break, Shake and Make".

1. He explained the 4 Stages for Industry 4.0. and discusses the procedure that we should prepare.
2. Break Assumptions
3. Empathize
4. Involve Others
5. Avoid Herd Mentality

He mentioned the words of Jack Ma ,the founder of alibaba group that stated "In about next 30 years, a robot will likely be on the cover of time magazine as the best CEO. Machines will do what human beings are in capable of doing. Machines will partner and cooperate with humans rather than become mankind's Enemy".



The 3 possibilities of Human and Machines interaction was also elaborated as follows:

1. Humans and Machines work together.
2. Humans and Machines fight with each other.
3. Machines and Machines fight with each other.

The concluding Lines from the expert were as follows:

- Growth of artificial intelligence in upcoming days will be like the following three statements
- “Artificial intelligence is growing up fast, as are a robot who’s facial expressions can elicit empathy and make your mirror neurons quiver”.
- “The world is changing whether you like it or not. Get involved or Get left behind”. ~ Dane Waters.
- “Do not wait until the conditions are perfect to begin beginning makes the condition perfect”. ~ Alan Cohen.

Mr.YASH N N

Global Technical Marketing Leader,Aruba

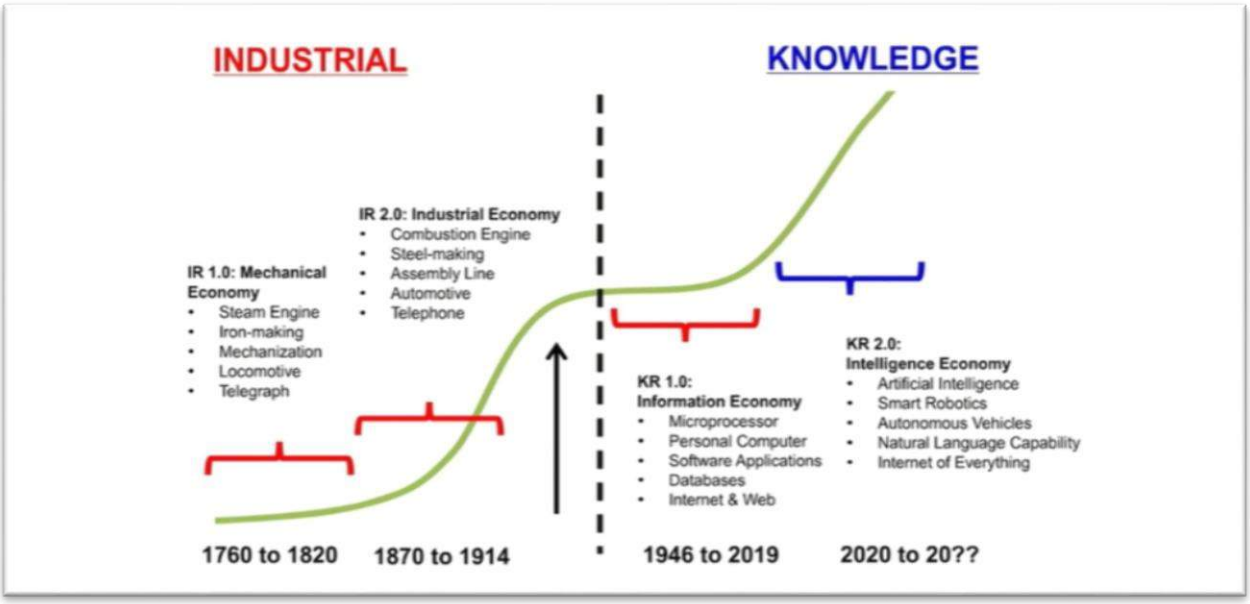
A Hewlett Packard Enterprise Company

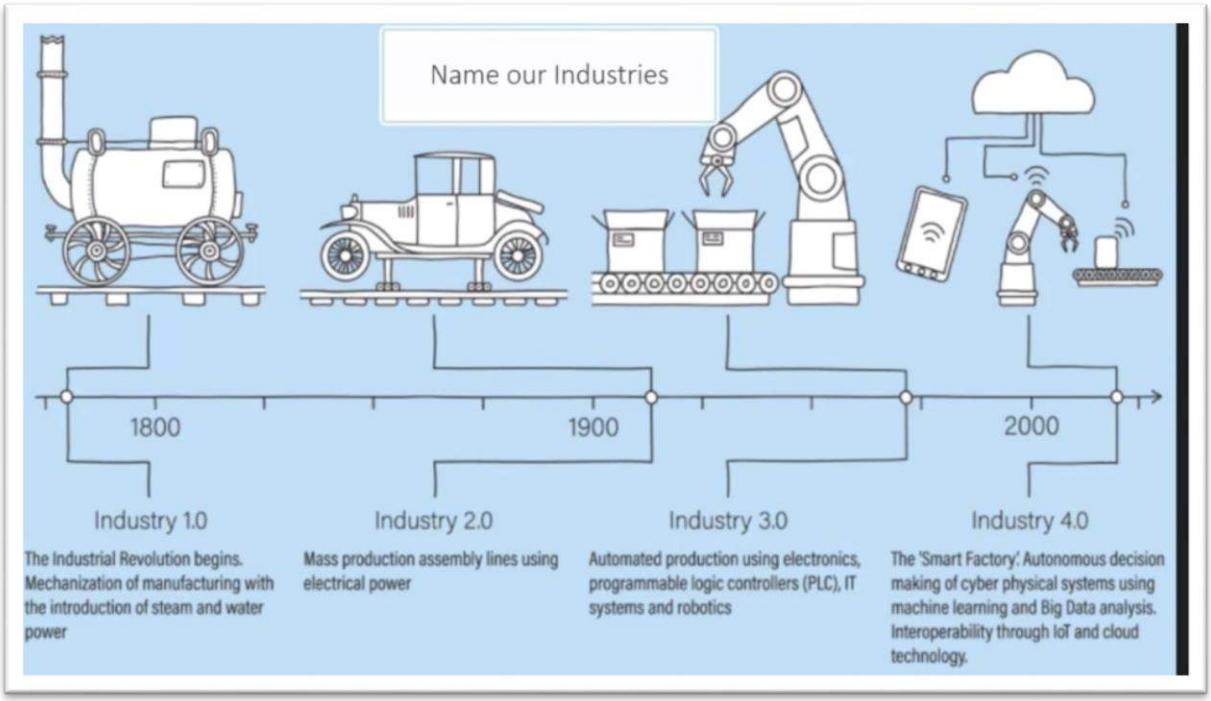
The afternoon session was conducted from 1:30 pm to 3:30 pm. The afternoon session was split into two halves with two different speakers. The first speaker was Mr.Yash N.N and was introduced by Mrs.Bharathi Gururaj, Asst. professor in ECE department, ACSCE.

Mr.Yash is a Global Technical Marketing leader in Aruba and H.P Enterprise Company. His role on TME team focuses on campus switching, network security, network management, network design reference architecture, Aruba Enterprise solution & Digital Industry 3.0 and 4.0 transformations. Prior to joining the TME team, he was Aruba Engineering section manager in the network test lab. He was responsible for leading qualification, flagship, switching product line, end-to-end multivendor solution across networking operating system. He received H.P President Quality award and Enterprise award .He worked for Cisco systems before Aruba.

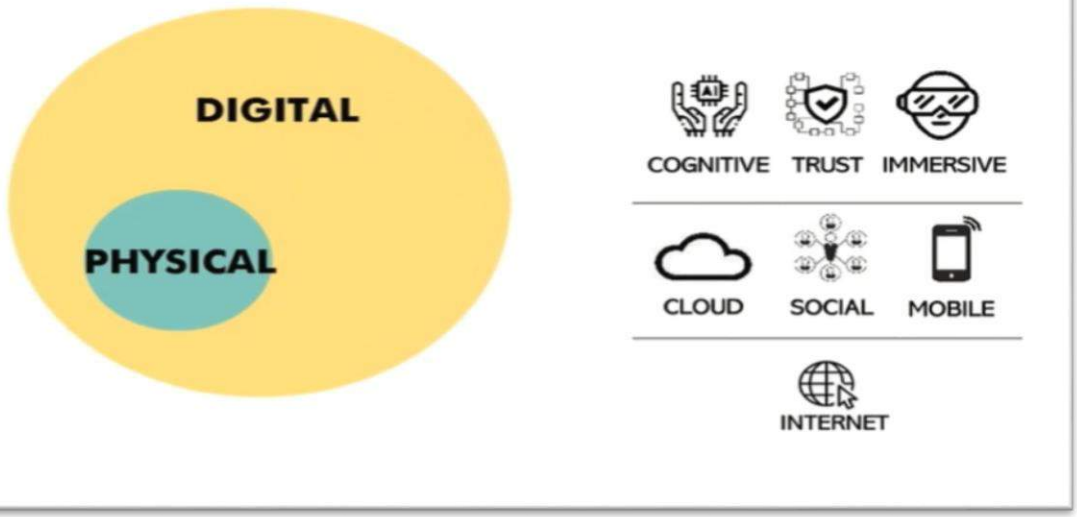
The main goal of Mr.Yash's speech was about the current scenario in digital transformation and its impact on our life all the way from industries 1.0, 2.0, 3.0 and what's going to be the future of industry 4.0. He gave lot of real time examples to make us understand the situation better. He gave a brief explanation on industrial revolution. The speaker talked about how the computer simulation will change the future as it is more affordable and takes less time. Industries changes or modifies as it transit into new era. Mr.Yash explained about how the technologies are evolving with respect to industry 4.0. He showed statistical representation of the level of connectivity and how much progress is occurring in each country compared to the countries that don't have high amount of connectivity. The impact of 3.0 is so strong that the devices like iphone, android, ipad, kindle, 4G , oculus, uber, snapchat and many more came into existence after 2007.

Some of his ppt slides were as mentioned below. He changed and added lot of real time cases in each and every session.





A History of Communication



MR.ANISH PANDARI

Director of Strategy and Product Development

Electrono solution private limited

& Social Proton

Chief Rainmaker

Session: 03

The second spokesperson of the afternoon session was Mr. Anish Pandari. He was introduced by Mrs.Vijaya Dalawai ,Asst. professor, ECE, ACSCE .He is currently working in social proton as well as Director of Strategy and Product Development at Electrono solution private limited ,Bangalore. He is an engineer and market passionate about technology in day to day life. Previously, he was the global head of marketing for energy utilities, natural resources for Engineering and construction division of WIPRO. He started his career at National Instruments and has served in many technical sales and product marketing roles ever since. He worked extensively with electronics, semiconductors, automobile, defense and aerospace industry. He is Alumni of Indian Institute of Management, Kolkata and he has dual masters in marketing from All India Management Associations and Christ University.

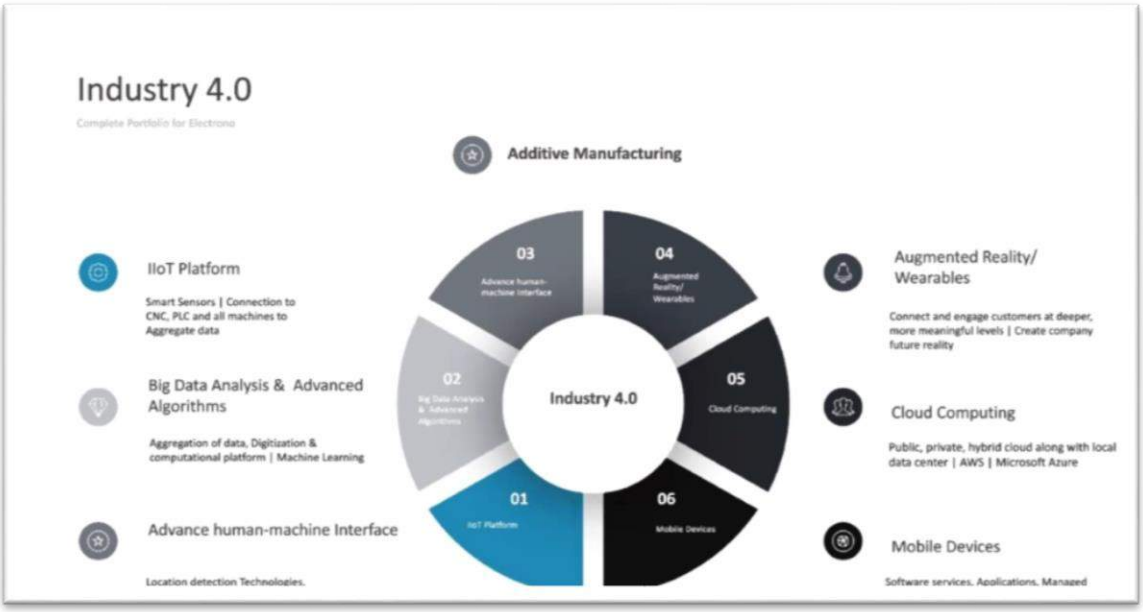
Mr.Anish spoke about his role in Electron solutions which focused mainly on industry 4.0 and he explained how Industry 4.0 can be applicable to academic sector. At first, he touched upon the agenda during the session. He started the session with a brief introduction about Industry 4.0.

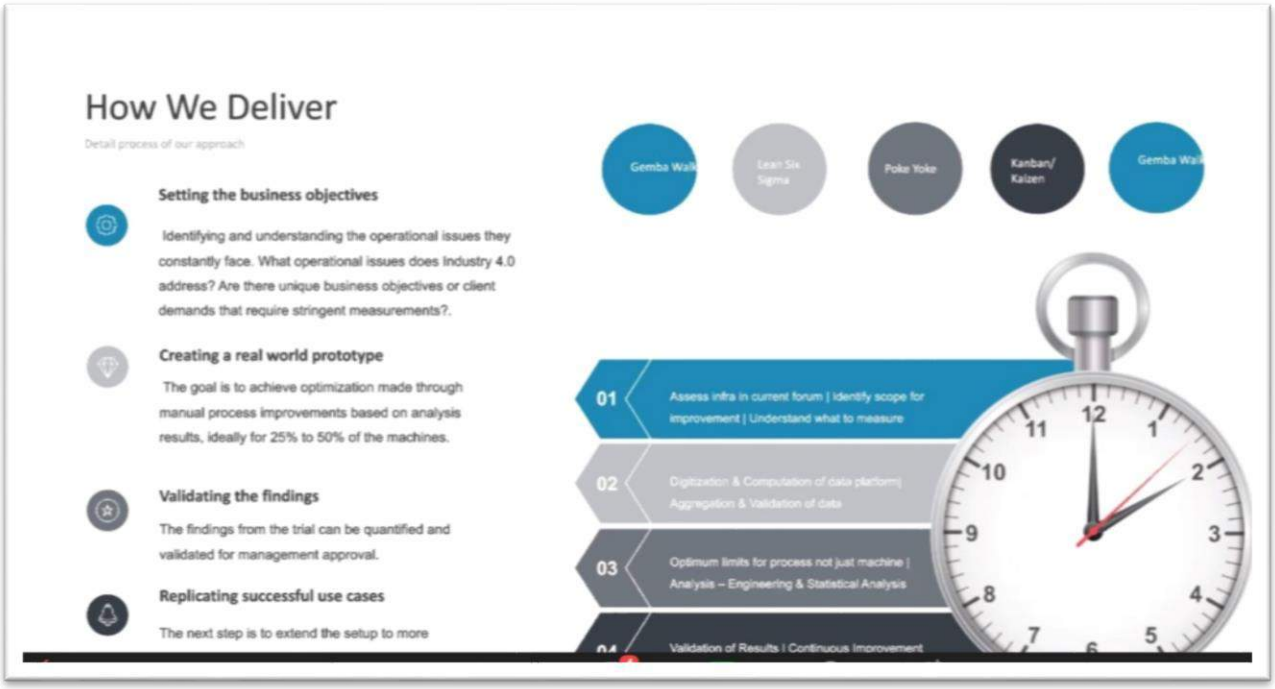
Some of the Various technologies discussed on Industry 4.0 are :

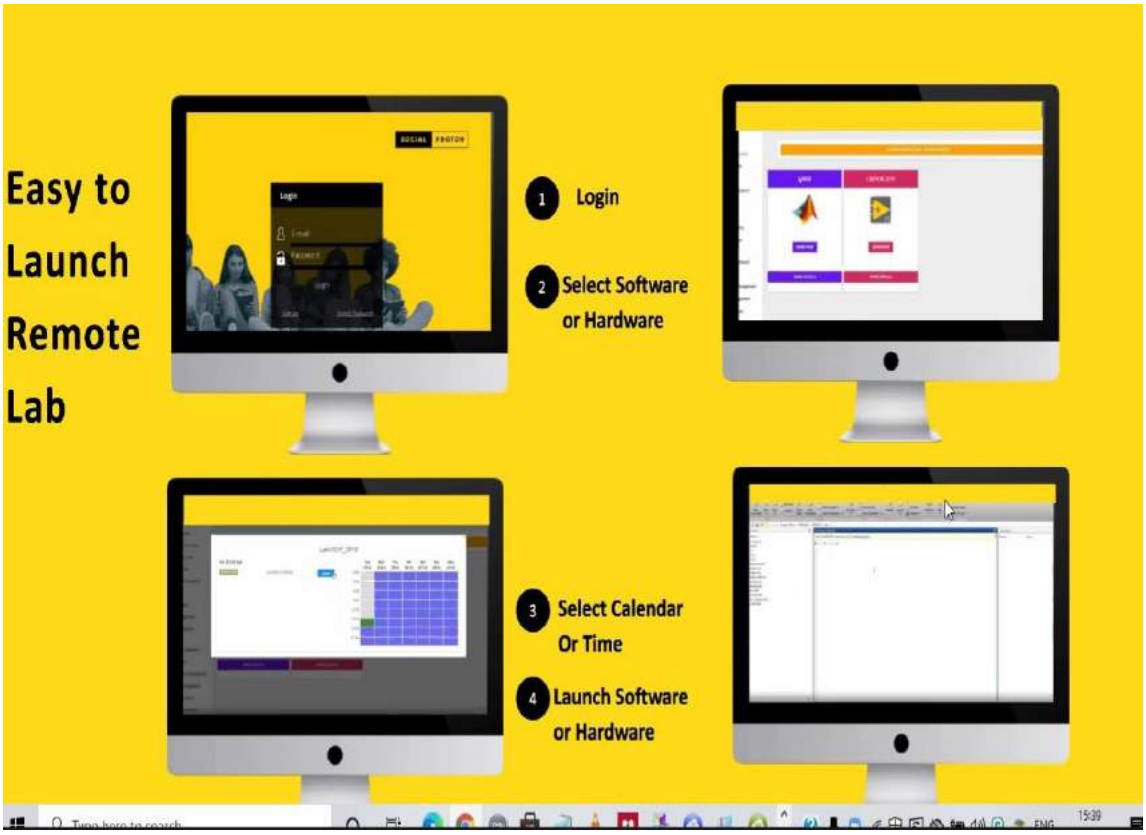
- Iot platforms
- Big Data Analysis & Advanced Algorithms
- Advanced human-machine Interface
- Augmented Reality/Wearable
- Cloud computing
- Mobile devices.

He helped the participants to understand the ground reality and the challenges for implementing Industry 4.0 and how companies can help to bridge between shop floor to top floor with single window visibility which is one of the big challenges.

Mr.Anish then talked about the current scenario i.e. issues with innovation and quality, inability of academics to keep pace with the changing technology, Demand and supply gap, un-availability of holistic metric to measure skills and accessibility to technology. He concluded the session by stating an example of how they were trying to setup a platform where the students from different universities and colleges across India can access lab remotely and be able to do hands on workshops. Last 10-15 minutes, he cleared all the doubts. Some of the snap shots from ppt are:




How We Deliver
Detail process of our approach
Setting the business objectives
Identifying and understanding the operational issues they constantly face. What operational issues does Industry 4.0 address? Are there unique business objectives or client demands that require stringent measurements?.
Creating a real world prototype
The goal is to achieve optimization made through manual process improvements based on analysis results, ideally for 25% to 50% of the machines.
Validating the findings
The findings from the trial can be quantified and validated for management approval.
Replicating successful use cases
The next step is to extend the setup to more
Gemba Walk
Lean Six Sigma
Poke Yoke
Kanban/ Kaizen
Gemba Walk
01
Assess infra in current forum | Identify scope for improvement | Understand what to measure
02
Digitization & Computation of data platform| Aggregation & Validation of data
03
Optimum limits for process not just machine | Analysis – Engineering & Statistical Analysis
Validation of Results I Continuous Improvement


Easy to Launch Remote Lab
1 Login
2 Select Software or Hardware
3 Select Calendar Or Time
4 Launch Software or Hardware

Mr. Mallikarjuna Sharma

CEO , Sky Techno Solutions and Electrono Solutions Pvt LTD.

Session 4

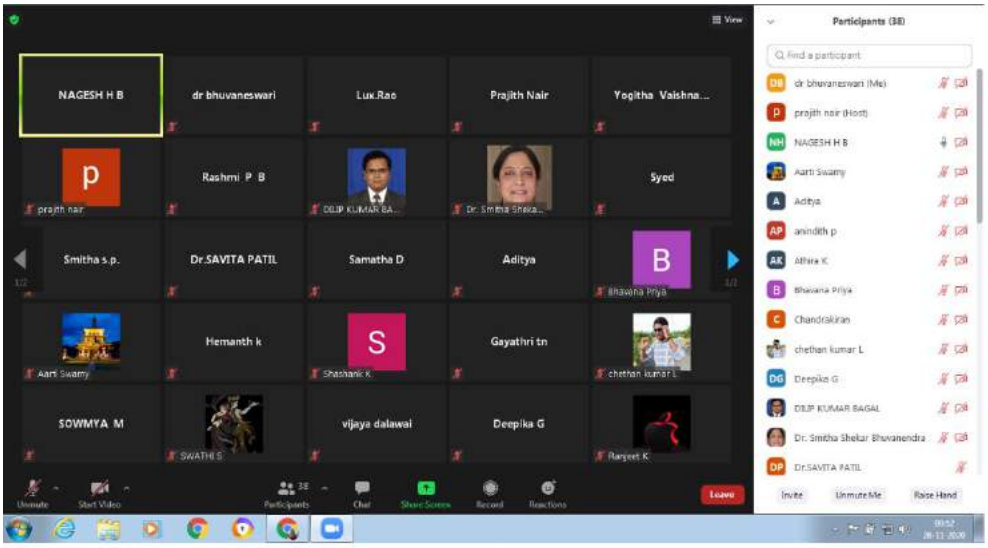
The Morning session was split into two sessions and it concentrated on the adoption of Industry 4.0 in various sectors. The speaker of the first session was Mr. Mallikarjuna Sharma who is currently working as chief digital officer in Electrono solutions. Prior to joining Electron solutions, he worked as manager, CIS in Fanuc. His speech concentrated on industry 4.0 and its adoption across various sectors. He gave an insight to the developing industry and the way to adapt advanced technologies along with its benefit's. He projected a clear understanding of the importance of intelligent robots and future problems in the real world being introduced into the industry 4.0.

Mr. Sharma introduced the overview on industry 4.0 as well as the architectural layers of industry 4.0. He also introduced the various FANUC controllers that can be used for industry 4.0 integration.

The main highlights of the talk were:

- Industrialization evolution
- Industry 4.0 – adoption across various sectors
- Cyber-physical systems (the industry 4.0 view)
- Architectural layer
- IIOT implementation in physical, data & network layers
- IIOT implementations tasks & typical parameters
- Different FANUC controllers integrated with 0i, 35i, 31i etc.
- Monitoring custom-screens as plant layout
- Intelligent maintenance systems & standard approach to machinery diagnostics.
- Web server & status notifications.
- Machine remote diagnostics & preventive/predictive maintenance

- Transient, periodic and event recording systems
- Assess your condition monitoring needs
- Enterprise software suite.



TOPIC:

INDUSTRY 4.0- ADOPTION ACROSS VARIOUS SECTORS

Speaker : Anish Pandari.

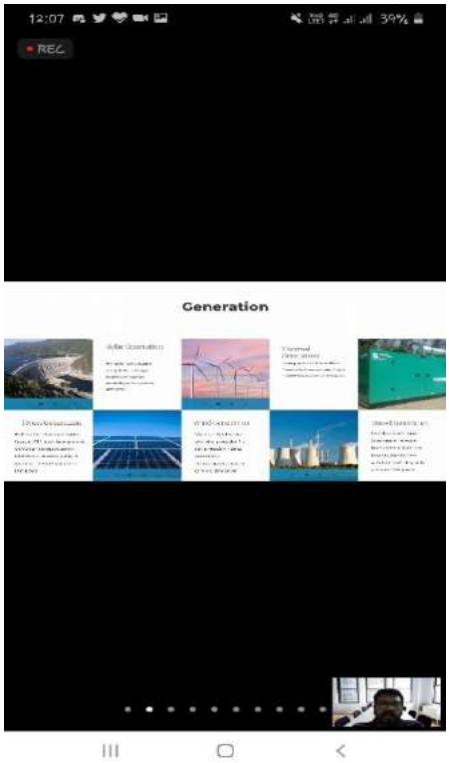
Mr. Anish concentrated on the basic skills required to evolve the existing technology to make it compatible with industry 4.0 as well as the areas of focus for creating a smart factory. The speech gave an insight into developing industry and the skills required to adapt to such advancement in technologies and its case study. He projected a clear understanding of the key challenges being faced in the industry and also provided a simplified solution to address such issues that is being faced in the industry 4.0.

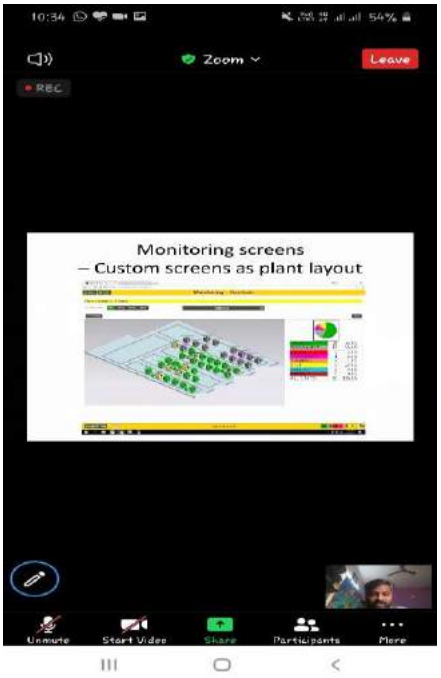
The main highlights of the Sessions included:

- Skills required for evolving technology
- Smart factory: areas of focus
- Health monitoring & material, stock and tool tracking
- Real-time quality measurement

- Real-time status monitoring.
- Variety of machining process
- Real-time activity monitoring & control
- Connected plant floor: factory monitoring & load balancing control
- Industry 4.0 utility.
- Key challenges faced in the industry & TIC objectives
- Core elements of COE: experimental learning, generation, transmission & distribution
- Unified command centre
- Testing platform

Few snaps from the session:




Zoom
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Monitoring screens
– Custom screens as plant layout
Unmute
Start Video
Share
Participants
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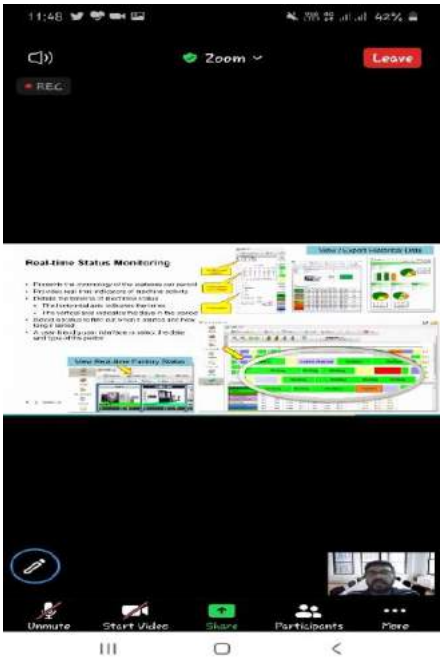
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Unmute
Start Video
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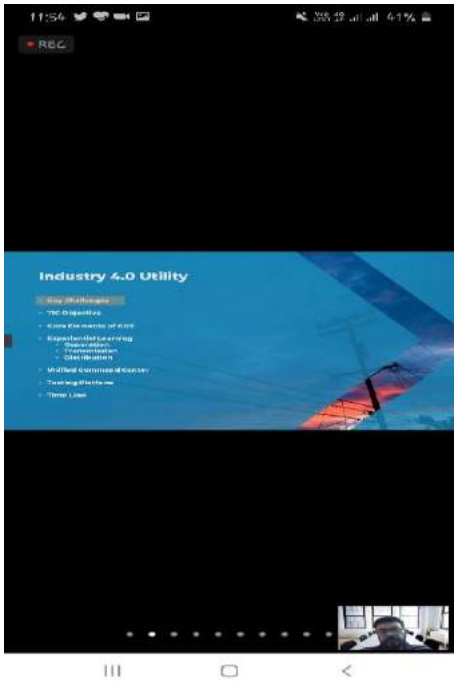
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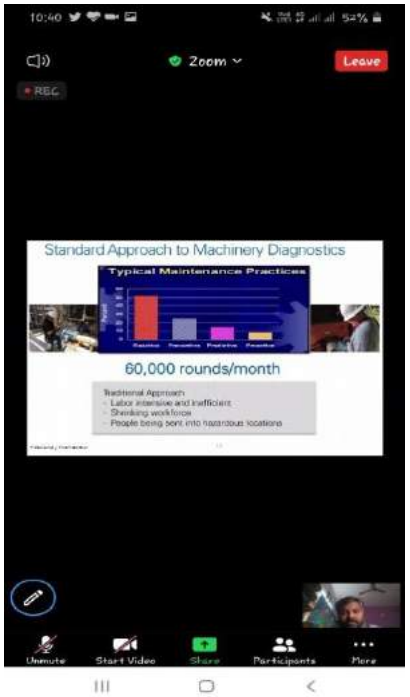
Industry 4.0 Utility


Zoom
Leave
REC
Standard Approach to Machinery Diagnostics
Typical Maintenance Practices
60,000 rounds/month
Unmute
Start Video
Share
Participants
More

DR. KUMAR M. A

INDUSTRY PRINCIPAL, ADVANCED ENGINEERING GROUP,INFOSYS

TOPIC: Industry 4.0 – Opportunities in Pharma & Healthcare
Speaker: Dr Kumar.

The morning session was split into two sessions and the session concentrated on the adoption of Industry 4.0 in pharmaceuticals companies. The speaker of the sessions was Dr. M.A.Kumar who is currently working in Infosys as Industry PRINCIPAL of Advanced Engineering Group. He has 30^{+} of experience in Developing Instrumentation, control solutions and Application Engg. His expertise lies in Consulting, Architecting smart manufacturing solutions and Execution systems. His industry specialization lies in Industry 4.0 and Manufacturing Automation and Execution systems. He is one among the leading Professionals in the world.

His talk concentrated on Industry 4.0 and its adoption across various Pharma and Health care sectors.

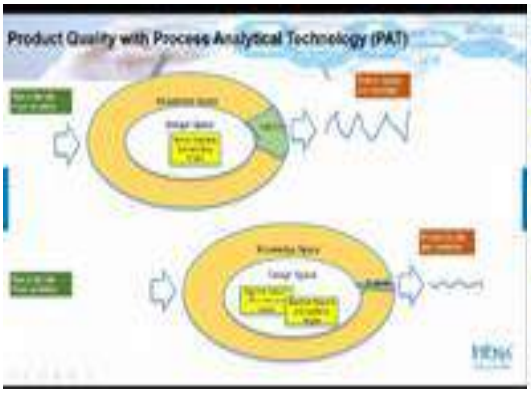
The speaker of the session delivered an amazing session on the opportunities for Pharmaceuticals & Healthcare sectors in Industry 4.0. He gave an insight to the key paradigms and strategy for digital transformation in the sector. He also explained the block chain concept in Pharmaceuticals and Healthcare sector and spoke of the QBD & PAT framework usage with real-time data & projected a clear understanding of the key factors and benefits of implementing such concepts in the Medical and Healthcare Industry. He also specified the importance of Block chain in health care.

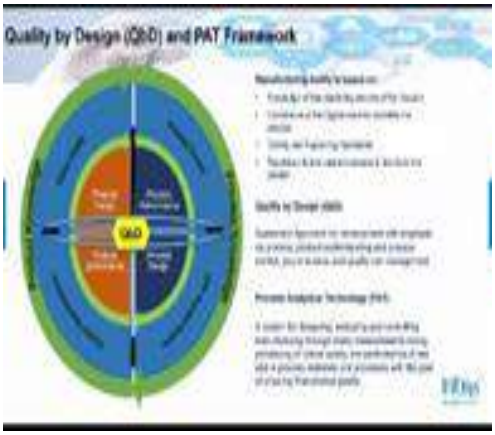
The Key Points of the session covered the following concepts:

- Industry 4.0- accelerating innovations in Industries
- Key paradigms of industry 4.0
- Technology Elements & characteristics of Industry 4.0

- Pharma Industry – Trends & challenges
- Key healthcare Industry challenges
- Digital transformation strategy for Pharma & Healthcare
- Reference architecture for industry 4.0
- OPC UA for industry 4.0
- Case study : Bio manufacturing & Vaccine manufacturing
- Quality by design (QBD) & PAT framework
- Block Chain in pharmaceuticals : checking counterfeit drugs and vaccine
- Block Chain in healthcare sector
- Additive Manufacturing in Healthcare (AM)

Few snaps from the session:





Mr. KALYAN B RAM

CEO,

ELECTRONO SOLUTIONS

PVT. LTD.,

BANGALORE

The speaker of the next session was Mr.Kalyan B Ram, CEO , Electrono solutions Pvt. Ltd., Bangalore. He is also the President of International Association Of Online Engineering (IAOE), Austria. Earlier, he worked with GE in the field of Control system Design for locomotives and Marine Sectors. He also worked with FANUC ,India as an application Design Professional .He has been the recipient of "Engineering Excellence award" for his contribution in developing a mechanism to perform quick ground detection in complex locomotive wiring and for developing control algorithms to help locomotives haul heavier loads under Subzero temperatures in the year 2008 and 2010 respectively.

His session mainly concentrated on "Introduction to data validation and analytics". Second session was continued on the same topic by Mr.Mallikarjun Sharma.

They gave an insight to the smart technology that can be implemented in an industry and strategy for digital transformation in an industry sector. He also explained the various steps involved in implementing IOT based manufacturing in major industrial sectors such as automobile and manufacturing industry and spoke of the technology stacks which works within the set framework for implementing such concepts in the industry.

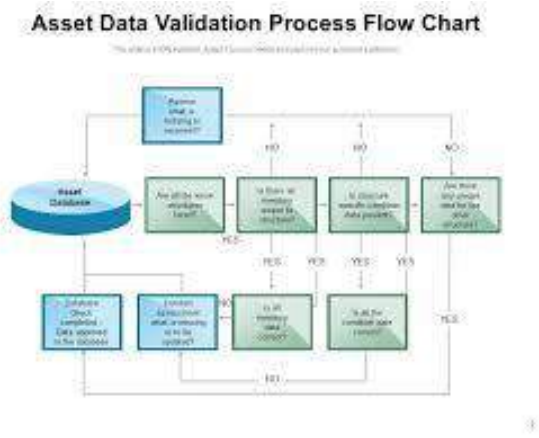
Some of the types of data validation discussed were:

- Code validation
- Data type validation
- Data range validation
- Constraint validation
- Structured validation

Some important key words explained were:

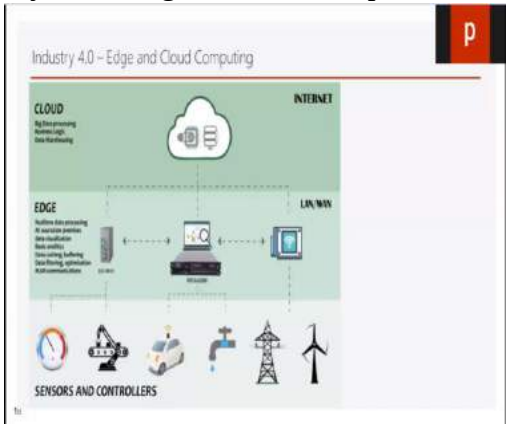
- Data-type check/ Data type validation is customarily carried out on one or more simple data fields.
- Simple range and constraint check.
- Code and cross-reference check.
- Structured check.
- Consistency check.
- Examples of data validation.
- Post-validation actions.

FOA process as well as the asset management process were also explained by speakers.



There is a requirement for sharing and consistent maintenance of data,when the information is imported into and exported from authoring tools,. The effective management of an as built asset relies heavily on the accuracy of the data collected and how it is validated throughout each stage of the project.

In today's modern methods of construction, digital asset management is essential not only for soft landings but the continuous management of the asset through its entire lifecycle. But this can only happen if the hard work is put in at the beginning and the project owner commits to digital information management from the very start. From then on, we can integrate the technologically advanced process of digitizing the way we design, build and operate to ultimately meet the operational needs of the assets' end-user.



The graphical and non-graphical data in project models are essential to produce the accurate information, both at construction and operational stages, allowing asset owners and occupiers ease of access to information and better management of spaces, materials and energy systems. This data needs to undergo continuous validation and verification to update information before the initial handover process. It must also reflect any changes during the build phase from the original design.

Some of the snap shots of the presentation:

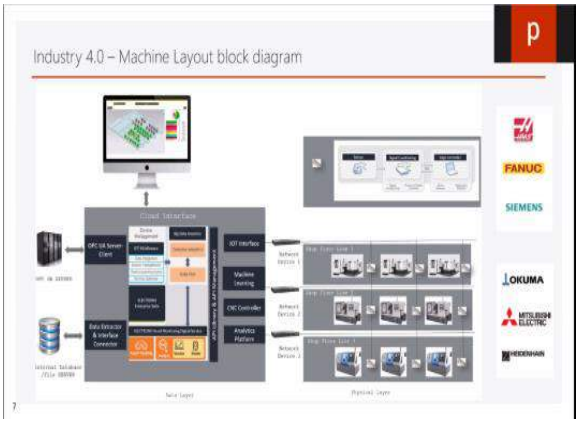
Mr. Lakshmi Narayan Rao

(Lux Rao)

SENIOR DIRECTOR

&

LEADER, NTT , India



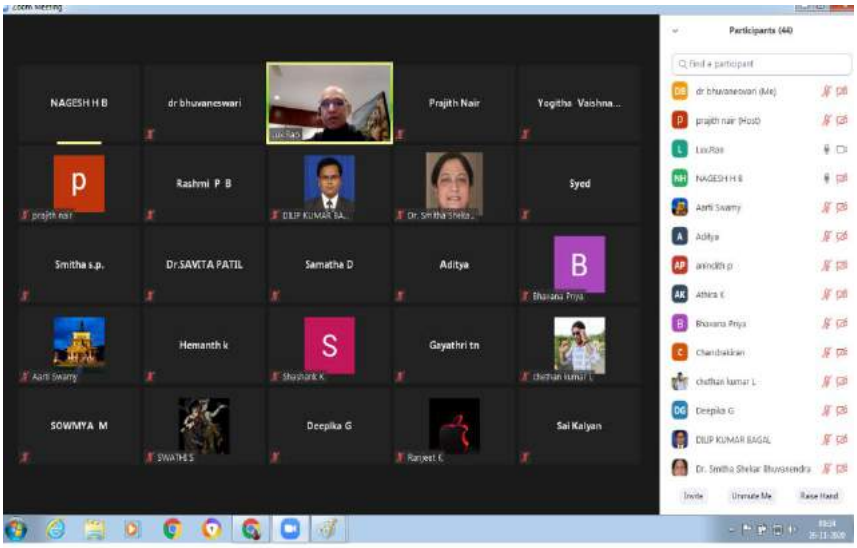
The first half of day five was split into two sessions and it concentrated on the adoption of Industry 4.0 in various sectors. The speaker of the day was Dr.Lux Rao who is currently working as Senior Director and head solutions at NTT ,India. The speaker of the session delivered an excellent session on the evolution in Industry 4.0. He gave an insight to the smart technology that can be implemented in an industry and strategy for digital transformation in the sector. He also explained the various steps involved in implementing IOT based manufacturing in major industrial sectors such as automobile manufacturing industry and spoke of the technology stack which works within the set framework for implementing such concepts in the Industry.

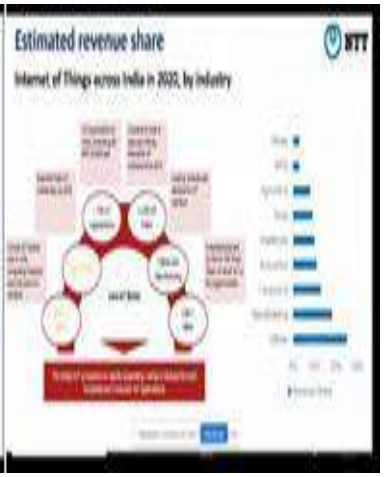
The Talk delivered covered the below mentioned points:

- Outlook of the manufacturing industry
- Smart factory in digital manufacturing
- Evolution of manufacturing towards concept of smart factory (Industry 4.0)
- The 4 stages of IOT solutions and its architecture
- Technology stack- security & services

- Journey to smart manufacturing
- Smart manufacturing strategy & solution
- Examples of implementation: plant monitoring, utility and energy monitoring, sound analytics etc.
- Case study: smart factory data analytics of packaging line, automobile manufacturer, fault reduction.
- Back to work solutions : social distancing on shop floor
- Smart factory based on international IOT standards

Few snaps from the session:





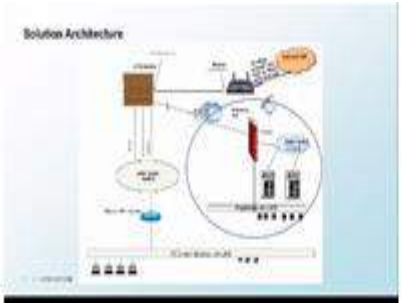
Day 6 of the STTP was divided into 3 session .The speaker of the first session Mr. Kalyan Ram elaborated on the impact of Industry 4.0 on Engineering education and Control system Design & Development prediction algorithms. He gave an insight to the typical solution architecture that the industry can implement. He also explained the various types of maintenance which are used in an industry such as TBM (Time Based Maintenance), DBM (Diagnostics Based Maintenance) etc. The role of simulation in today's modern Industry was explained briefly with solid real-time data. He also explained the Reliability Engineering i.e. the bathtub curve that has a major role to play in the industry 4.0.

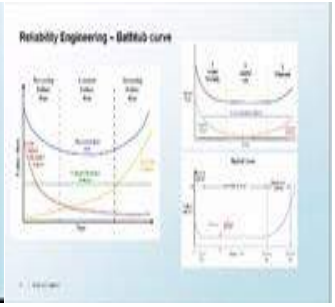
The role of Machine Learning (ML) in the industry which can be used for time series cyclic & acyclic data was also explained briefly in the session. Overall the session was exciting and filled with real-time data and knowledge sharing was the best of all the sessions.

HIGHLIGHTS IF THE COURSE CONTENT DELIVERED IN THE SESSION WAS AS FOLLOWS:

- Implementation challenges in Industry 4.0
- Typical solution architecture
- Reliability Engineering – Bathtub curve
- TBM
- DBM
- CBM (Condition Based Maintenance)
- Measured and derived parameter's for CBM
- Role of simulation in Industry 4.0
- ML for time series cyclic and acyclic data

Few snaps from the session:





SREEKANTA ARADHYA

CHIEF EXPERT
Robert Bosch Engineering services &
Business solutions

The speaker of the second session was Mr.Shreekanta Aradhya who delivered an amazing session on the key trending technologies on Industry 4.0. He gave an insight to the trends and different applications used for some specific purpose and use. He also explained the use of VR and AR in the industry which also plays an important aspect in terms of Technology Advancement. He showcased us with some real time working data such as the way their COBOT (Collaborative Robot) works in the real environment on a shop floor using many videos. The role of 5G in the manufacturing sector was explained with some case study to support the stand with visual examples.

The session covered the following points:

- Convergence and application of 9 digital industrial technology
- Industry 4.0 – overview and current trends
- Usage of augmented reality (AR)
- Usage of virtual reality (VR)
- COBOT- Collaborative Robot (APAS from Bosch)
- Autonomous intelligent vehicle – AIV (Active shuttle)
- The role of 5G in manufacturing.

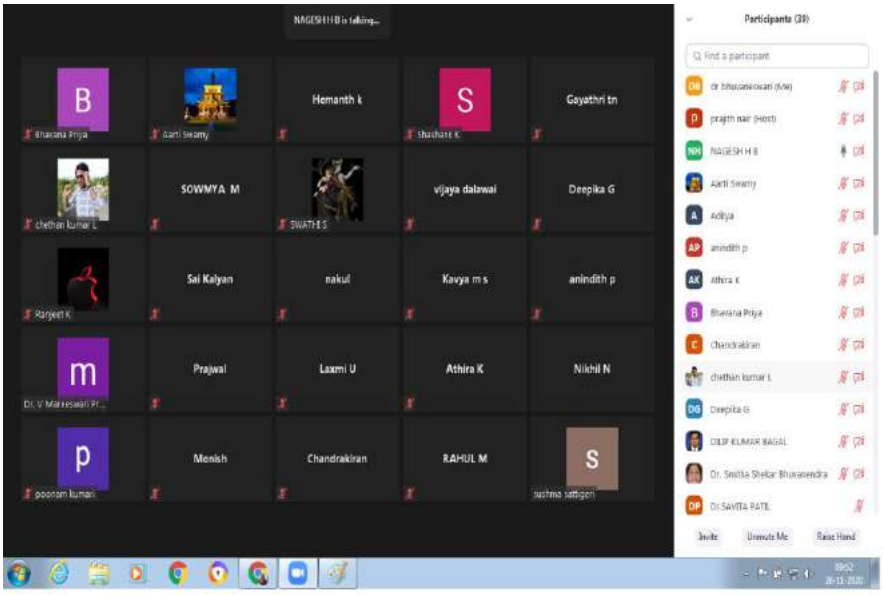

Industry 4.0 - Overview & Trends


Smart Automation using AR / VR for Industrial Machinery


Autonomous Intelligent Vehicle -AIV
Active Shuttle
Bosch Rexroth
ActiveShuttle


5G in manufacturing
Selected Challenges of Industrial Applications


5G in manufacturing


Hemanth k
Gayathri tn
SOWMYA M
vijaya dalawai
Deepika G
Sai Kalyan
nakul
Kavya m s
anindith p
Prajwal
Laxmi U
Athira K
Nikhil N
Monish
Chandrakiran
RAHUL M
Participants (39)

NOTE:

All the four sessions had the same flow of course content. We had some speakers to deliver more contents and some less content depending on their availability during the four sessions from October to December 2020.

Valedictory Session:

The valedictory session for the Six day online STTP programme on “Industry 4.0” sponsored by AICTE , was conducted for all the four sessions on sixth day of the event. The chief guest of the session was Mr. Arun Kumar, Director, R&D, Electrono Solutions.

Mr.Arun Kumar introduced the participants to the various technologies implemented by Electron solutions on Industry 4.0 and its applications. The speaker presented a live presentation on the technologies and practical projects implemented by the company. He took the opportunity to thank the organizers for providing the platform for conducting practical sessions as well as the interactive session with the participants. The speech was followed by a Question and Answer session where the chief guest interacted with the participants and answered their queries.

Mr.Prajith Prakash Nair, Assistant Professor, Department of Electronics and Communication Engineering delivered the Vote of thanks. The participants were asked to take up the Online Quiz based on “Industry 4.0” .The certificate of participation was given to those who successfully completed the quiz as well as attended all the session as per AICTE norms.

Google form was created for the quiz questions and all participants were asked to fill the same and send it as a part of completion of the event.

Dr.H.B.Bhuvaneswari concluded the event by thanking the AICTE, Management, Principal, Experts, Participants, their faculty members (Dr.Bharathi Gururaj, Prof.Nagesh, Prof Vijaya Dalawai, Prof. Prajith Nair) for their dedication because of which the program was a big success.