



Crusade  
CLARION CALL

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## A silent mobility revolution

# ELECTRIC CARS

Several studies carried out by British Petroleum, McKinsey, International Energy Agency and International Renewable Energy Agency predict that by 2030, there will be around 200 million electric cars, 900 million two and three wheelers and 10 million electric buses and light duty vehicles. 30% of kilometres travelled by passenger cars could be powered by electricity by 2040.

Similar studies have also reported that 100% reduction in current levels of CO<sub>2</sub> emission is possible with switching over to renewable sources for generation of power. Solar photo voltaic (PV) and wind will account for 70% global power capacity expansion during 2020-25. By 2040, with 30% of kilometres travelled by passenger cars powered by electricity, renewable energy powered electric cars indicate an excellent eco-friendly and sustainable mode of transportation.

Battery electric vehicles such as the Tesla cars have zero tailpipe emissions. Hence there will be no smog in the cities, resulting in clean air in cities. When such electric vehicles are used together with renewable energy, they fight climate change with very low carbon footprint. Electric cars can easily achieve average CO<sub>2</sub> emissions target. For e.g. the EU Target in 2015 was: 130g of CO<sub>2</sub> or 17.8 kmpl mileage for petrol cars and 20.4 kmpl for diesel cars. The revised target for 2021 is 95g of CO<sub>2</sub> or 24.4 kmpl for petrol cars and 27.8 kmpl for diesel cars. These values impose huge technical demands on the combustion cars, while these are easily achieved in electric cars.

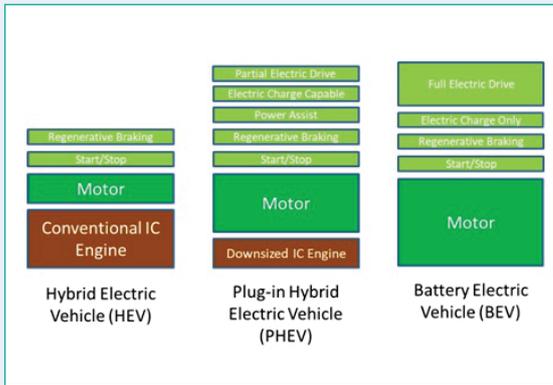
A hybrid electric vehicle abbreviated as HEV uses a motor over and above the conventional IC engine. The motor is used for start, stop and to regenerate energy during braking. In a plug-in hybrid electric vehicle abbreviated as PHEV the engine is downsized and a motor is used to start, stop and regenerative energy during braking. In a PHEV the motor delivers power when required and is used in power assist. External electric charging of the battery pack is possible in the case. It has a partial electric drive. The battery electric vehicle

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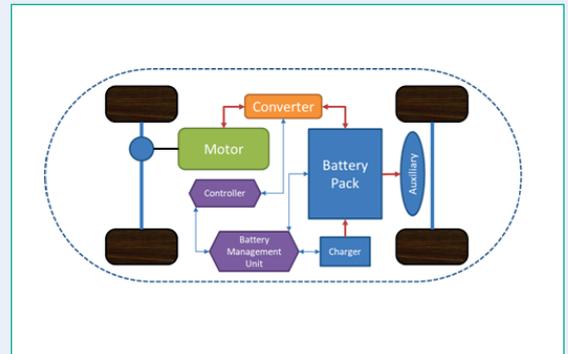


abbreviated as BEV does not have an IC engine. It uses only a motor, the motor performs traction function, Start, Stop and regenerative braking. Only electric charging is possible and it uses a full electric drive. Toyota Prius is an example of a plug-in hybrid electric vehicle. Tesla Model 3 is an example of battery electric car.



A battery electric vehicle such as a Tesla, has a charger, a battery pack, converter, motor, transmission drive, controller and battery management unit as the essential subsystems. The charger is used for charging the battery pack and connecting to the external energy source. The battery pack is used for storing the energy. Converters are used for converting

voltages from high to low and vice versa. They are also used to convert AC to DC and DC to AC as required. Motors provide traction to the vehicle and are hence known as traction motors. Controllers are used to control the vehicle operation including its acceleration, braking etc. Battery management system is used to manage the parameters of the battery pack and individual cells in the pack.



Reports say transport sector accounts for 24% of the total CO2 emissions. 75% in the transport sector emissions is from road transport. On an average an IC engine powered vehicle emits 4.7 metric tons of CO2 yearly. A BEV will save 4.7 metric tons of CO2 every year if supplied from a renewable source of energy. Hence it is proved beyond doubt that renewable energy powered electric cars will not only reduce pollution but will provide sustained development of the mobility space.

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# My Classroom in My Mobile Phone



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I can still recall the day when teachers would say “how about I bring you a pillow and a bed so you can comfortably sleep?” to sleepy kids, little did anybody imagine that one day we’d actually be lying on our bed comfortably and attend classes. Well, welcome to 2020. Who thought someday we will have video calls with our teachers? Nevertheless, online or classroom, students somehow found their own ways of joking around teachers. From the “don’t use mobile phones in class” to attending classes through mobile phones, a lot of things changed overnight. “Mute yourself” has become the new “Keep quiet”. Jokes apart, 2020 indeed was a roller coaster ride especially for students.

We all thought it’d be fun, and it was fun initially but as the classes went on for hours and hours, soon we realized how difficult it is to gather our thoughts, stare at a gadget and stay attentive amidst the noise of the cooker whistle and serial dialogues. However, the struggles teachers faced cannot be neglected. Teachers were once thought to be nerds, who got attached only to chalk on blackboard, until they learnt how to host a virtual meet within few days. Every teacher had to put in their time to understand how these meeting apps worked, had to work overtime to prepare the contents to be delivered. Somehow, from the young to old, everybody had started using smart phones and other gadgets to attend to their online classes and meetings. The world stopped for a while without actually stopping. Thanks to science!

Although, the market went down for several businesses, few companies made a huge come back because of the pandemic and many software firms had invested millions in developing mass video conferencing apps, pdf converters, online streaming apps and even online exam portals.

One attractive thing about online class is that you can access all the study materials, classroom discussions from the comfort of your own home. This



mode of study also offers more of your teacher’s attentions rather than a teacher having to spread their focus amongst several other students. Additionally, I have personally learnt that, to be a successful learner, one has to be self- disciplined and be able to work well on their own.

One of the best things that “COVID online class rooms” as I like to call it, had taught us is how to adapt to different situations faster. It’s funny how holding the mobile phone and scrolling through social medias for hours is not causing as much of a back pain as caused by sitting in front the same mobile phone for online class. However, this definitely has taught “Patience” to a lot of us.

Of course, wasn’t this kind of virtual meetings foreseen? Somehow, I guess the world was bound to change to this mode of learning and meeting sooner or later, just that we were not expecting it to show up all of a sudden like this. Moreover, things would have been traumatic in the pandemic, still, there are a lot of things that we had learnt and should learn. With a vision of optimism, we should improvise ourselves and adapt ourselves to get the better out of the situation and this mode of learning was the best we could have done in this scenario.



## YEAR 2020

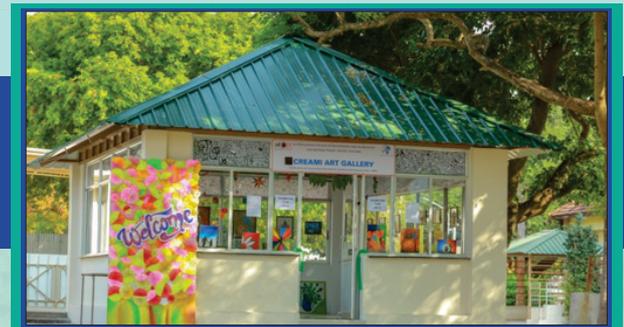
### STARTED WELL AND ENDED WELL

The Year 2020 started off well for Centre for Innovation Business Incubation and Entrepreneurship (CIBIE) since we could bring to daylight some of the projects that were under discussion for a long time. For instance, CreaMi Art Gallery that was inaugurated on 08/01/2020 was on discussion with the Doodlers of Fine-arts Club for over a year. It all started when it was noticed that the artworks of students that were on display during the Technical Symposium probably 3 days in a year received good response from the audience, many of the drawings were sold out, students, staff and others bought them as gift articles. This mooted the idea of why not launch this as a business throughout the year, since there were decent number of paintings and pencil sketches lying in the Finearts Club repository even after the event, literally gathering dust. CIBIE started having discussions with the Finearts Club members and they also showed interest and were excited as their work will finally get some recognition throughout year. This paved way for seeking approval from the management to provide a space for a permanent exhibition cum sale inside the campus for all the artworks done by students and staff throughout the year. This project was called CreaMi and all the artworks were on display along with a price tag, if not for the lockdown the project would have been a roaring success.

As every year this year too CIBIE joined hands with Forge to select the students to enroll for Protosem, an unique course meant for promoting innovation and entrepreneurship. Towards the end of the selection process 8 students were shortlisted out of which 6 showed interest to join the six month course at Forge, KCT IT Park. Of course, subsequent to pandemic spread the course was converted to online mode but the students did not lose the spirit and benefited through remote sessions and self study. One of the students, Manoj came out with a new product, Automatic Sanitiser Dispenser and another student, Siranjeevi was offered internship cum placement in Thoughtworks, and rest of the four acquired cross functional skills and are ready to join companies. 2020 was a Good year for CIBIE no doubt, more so as it was recognized and awarded as the Business Incubator by MSME subsequent to applying for India

**Mr.ARUL KUMARASAN**

CIBIE



Challenge 2020. Totally 10 projects 5 from the students and another 5 from the companies were scrutinized and uploaded for the contest. Today CIBIE is an MSME Business Incubator. Of course CIBIE had to go on hiatus due to complete lockdown from April till June 2020. Some of the Startups such as; Mash Technology, Blink Automation, CreaMi took a break as the business came to a grinding halt. However, CIBIE continued its activities conducting over 10 Webinars inviting experts from the industry as well as through internal source to disseminate inputs that would encourage students to leverage on the lockdown period to experiment with their business ideas.



Apart from the above CIBIE also organized sessions on competitions such as Anveshana by Agastya and Global Students Entrepreneurship Awards by Entrepreneurship Organisation. This had a good response from the students, some of these ideas are in the process of maturing as a business model. The continuous interactions and follow ups lead to the birth of three Start-Ups in the month of December 2020.

1. Terrain Industries Ltd, founded by T. Praveen, final year student of EEE Department.
2. J.K. Coir, founded by S. Karthik, BE Mech Graduate from other college.
3. Technitto, founded by K. Vinod, an alumnus of NPTC

In the times when we were all wondering how this pandemic break out is going to affect or demoralize youngsters from trying something new, it gave a new sense of belief towards future as we saw COVID did not stop but served as an impetus for youngsters to accept the new normal marching ahead, breaking the barriers to launch their business ideas. Icing on the cake is receiving grants by J K Coir by EDII, TN, for their innovative idea to bring out coconut dehusking machine that solves a major problem for coconut farming community. We hope to do even better in the New Year 2021.





# LIFE outside classroom



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Life is a river that flows in One Direction. Hi everyone this is Raji doing my final year in BE Mechanical Engineering. Through this article I would like to share a few of my fond memories in my college life.

Enrolling as a student in MCET in itself was not a preplanned decision. In fact I never dreamt that I would be studying Engineering. It was way far from my passion and dreams. Nevertheless, I entered into MCET with a sponsorship from TVSM. First year of my college life was mostly spent in classroom. Attending events once in a while gave memories to cherish and learning. As most of the time spent was within class everyday seemed like a routine activity. Then came second year. I started to explore more, got involved in clubs, cultural, sports and other extra and co-curricular activities.

There started my college life outside classroom. Classroom teaches you technical stuff but life outside classroom teaches you both technical knowledge in right avenues and lessons for life. That was evident from my second year. Whenever I got the opportunity, I would explore, and do something extra or different. Third year was an unforgettable experience. That was the year I joined the college vehicle building team, for BAJA 2019, MCET Mavericks. For me that was the year with immense learning, experience, knowledge gaining and fun & searching memories. That was the year when life outside classroom was way more than the life inside classroom. Days in college would start and end in garage. Early morning wake up calls, and late night documentation works and of course, tons of On Duties. But it was time well utilised. Teaching Learning Convention 2019 was a great learning experience. We were exposed to different teaching methodologies for better learning and teacher - student interactions. We as a team devised and presented it during the first TLC Meet in our campus and bagged first prize.

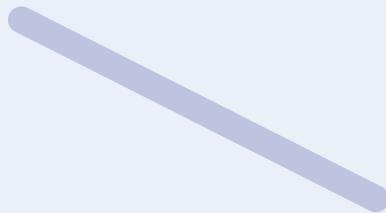
I was not always inside the classroom, but I would surely say, I was always learning either technical or non - technical lessons. In the three and a half years of college life, I was able



to gain many experience, lessons and millions of memories. In this era of social media, I would proudly say, I know more in my real life compared to my Facebook friends and Instagram followers.

It is not about being outside classroom. It is what we do outside classroom which is more important. Many of us bunk classes for the sake of it. Of course it gives memories, but without value. And there are many among us who skip classes but only to explore and learn thus making memories and self-discovery.

Being in a stream that was once not my passion, the life outside classroom made me love what I do and allowed me to do what I love. It set me on the path of self-discovery. Life is not just about classrooms, exams, marks and work. Classroom is important, yet everything we learn in classroom may or may not help in future. But everything we learn outside the classroom will surely help us in life. So step outside, explore, learn, experience, discover yourself and keep in touch with your passions and enjoy life. Cuz you only live once!!!





# Online Learning Experience Of SYSTEM APPROACH FOR ENGINEERS COURSE

Online learning has shown significant growth over the last few months. Since the COVID-19 outbreak, online learning has become the new norm in people's lives. The pandemic has forced schools, universities and companies to remote working and this booms the usage of online learning.

So let me share my experience about the online learning, it is in our hands to change the learning into delight or dismay.

There are some courses which I dived "deep into the sea happily".

One of the courses in that is SYSTEM APPROACH FOR ENGINEERS before starting this course I had many expectations that this would be something more hands on as opposed to other courses.

It totally nailed my expectation I was really satisfied with the outcomes of the course. The theme of the course started by why? (the need of the course). Then it showcased the things which are going around us and how the world is evolving with new technologies.

They also related the things of the past for our easy understanding. In case, you are facing a problem it may be personal or official, the outcome of this course teaches you how to analyse the problem and what steps should one take to solve it.

This is not only relevant for engineers but for everyone. This course mainly includes:

## SYSTEM THINKING-

It is a language for describing and understanding the forces and interrelationships that shape the behaviour of systems.

Basic process of system thinking is synthesis. They have three levels.

- i. AWARENESS
- ii. ANALYSIS
- iii. SYNTHESIS



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### Principles of system thinking are:

- i. A system is more than the sum of its parts.
- ii. A system is no better than its weakest link.
- iii. Optimizing the parts will not optimize the whole. Interaction determines the performance of a system.

### ICEBERG MODEL:

The iceberg model is a system thinking tool designed to help an individual or group discover the patterns of behaviour supporting structures, and mental models that underlie a particular event.

### SYSTEM APPROACH FRAMEWORK:

A system is a collection of parts that interact with each other and function as a whole.

There are three steps:

#### I. INPUT( consist of four sub-stages)

- a) Need
- b) Investment
- c) Expenses
- d) Constrains

#### ii. TRANSFORMATION

Which includes the process from input to output by the concept causal loop diagram and stock and flow diagram with the help of the tool VENSIM AND SPLASH.

#### iii. OUTPUT(consist of two types)

- a) Technical output which is quantitative
- b) System output which is qualitative

### CAUSAL LOOP DIAGRAM:

Causal loop diagrams are also known as system thinking diagrams, they are used to display the behaviour of cause and effect from a systems stand point. It aids in visualizing how different variables in a system are interrelated. The diagram consist of a set of nodes that represent the variables and edges are the links that represent a connection or a relation between the two variables.

They have two types of loops:

#### I. REINFORCING LOOPS

Is a cycle in which the effect of a variation in any variable propagates through the loop and returns to the variable reinforcing the initial deviation?

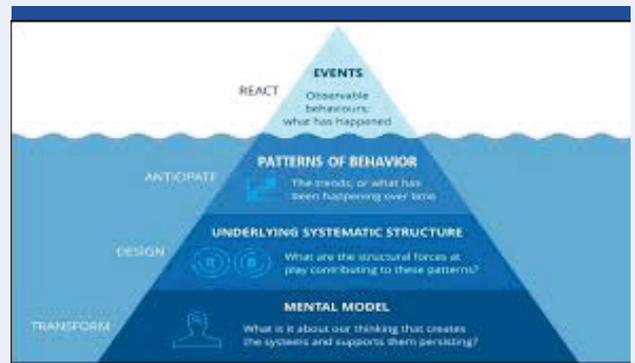
#### II. BALACING LOOPS

Is a cycle in which the effect of variation in any variable propagates through the loop and returns to the variable a deviation opposite to the initial one?

### STOCK AND FLOW DIAGRAM:

A system is a set of interrelating interconnected parts of elements that together, generate some distinct outcome.

They are basic building blocks of system dynamics model.



Elements of stock and flow diagram are:

- i. STOCK- It is accumulation of something.
- ii. FLOW-It changes a stock overtime.
- iii. FLOWRATE-If these flows into/out of stock that keeps track of things of type X.
- iv. CLOUD- It represents the source of the flow or the sink of the flow.

We have also learnt about globalization, digitization, binary economy, systems approach, physical process and service process, new solution and replication of solution, and behaviour patterns of system.

I would say that this course was a package of innovation and a turn off for the books.



# FROM MECHANIC TO MANAGING DIRECTOR

## A Success Story from CIBIE Diaries

**Mr.ARUL KUMARESAN**

CIBIE

R. Karthick was a boy hailing from a humble Pollachi family, raised only by his mother due to untimely demise of his father while he was in 4th standard. As the family could not afford private school he was subsequently admitted in Government School. His mother became a flower vendor to make both ends meet. Karthick, a responsible son who understood the pains of his mother focused on his studies and secured State Second Rank in Higher Secondary and was interviewed by the daily journal and got mentioned as an achievement by a studious and sincere boy of a flower vendor.

Chasing his dream to become an automobile engineer he joined Mechanical Engineering course and after completion went to Chennai in pursuit of an opening in Automobile companies. The low remuneration offered to automobile engineers in Chennai forced him to take a decision to return to his hometown and look for opportunity in Coimbatore. Eventually he found a break and got employment in Bull Machinery, Coimbatore.

On the first day of his job, his Boss Rajiv Talwar advised him that if he wants to become an Automobile Engineer he must first shed the ego that he is an Engineer and learn the basics viz, welding, assembly fitment, etc like a Mechanic. Karthick greased his elbow day and night to acquire all necessary skills to fulfill his dream.

He subsequently worked for TAFE when TAFE took over their company and got very good exposure in Production, Quality, Customer warranty control and analysis. In 2018 Karthick took a confident decision to quit the job to join elsewhere looking for better opportunities. One of his uncles who owned a brick kiln enlightened him that there was a great demand for Electric Vehicle for moving goods internally in Chambers and similar industries. Karthick started doing market study to understand the actual demand for Evs.

Market research gave him confidence and he planned to start a company addressing all the problems faced by the customers through the



Managing  
Director

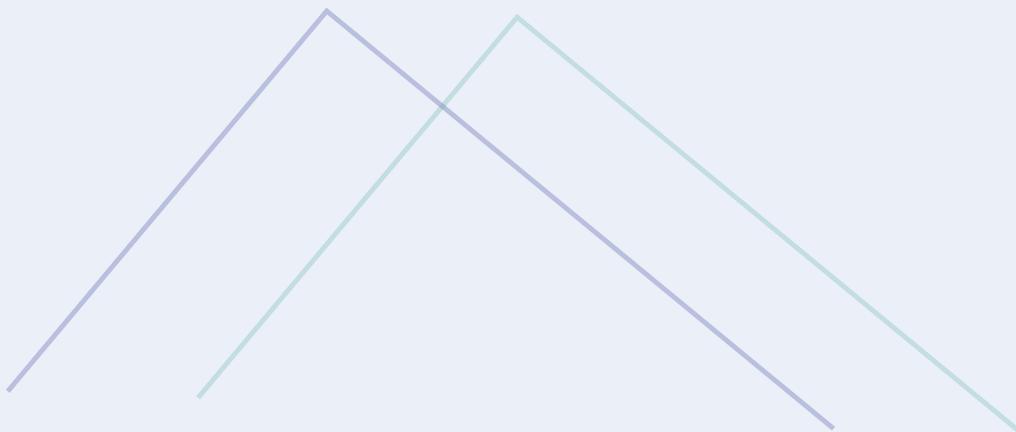
existing EV manufacturers. His first customer was his own uncle who was into brick manufacturing. The first EV fabricated by Karthick was rolled out and was used for marshalling bricks and clay in the chamber.

Initial business did not fetch any profit but gave him great satisfaction and knowledge to augment the EV meeting most of the customer's requirements that enabled him to standardize the best EV Model. Subsequently, he registered his company in the name of TAARK Equipment Pvt Ltd.

TAARK today is manufacturing off the road, campus EV for Textile Industry, Bleaching Companies, Brick Kilns, Poultries, and Cement Manufacturers. Thus far TAARK has delivered 132 EVs in a duration of one year.

As a first generation entrepreneur he has faced several challenges such as, shortfall of funding, operational expenditure, marketing, handling suppliers etc., but patiently persevering helped him to overcome the challenges. Today he is

confident that he can scale up his business and meet the demands of the customer as he has got complete hang of the trade. He feels his decision to become an entrepreneur was the best decision that he has ever made in his life.



# Drawings by our

## Engineer



Black and white brings more colours and memories.



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Art is not handicraft, it is the transmission of feeling the artist has experienced.



Night brings our troubles to the light, rather than banishes them. -Lucius Annaeus Seneca

