

BACET

spectrum

JANUARY 2024

VOLUME 1 ISSUE 1



**B.A. COLLEGE OF
ENGINEERING & TECHNOLOGY**
JAMSHEDPUR, JHARKHAND
RAJENDRA VIDYALAYA (RV) GROUP OF INSTITUTIONS
APPROVED BY AICTE & AFFILIATED TO JHARKHAND UNIVERSITY OF TECHNOLOGY

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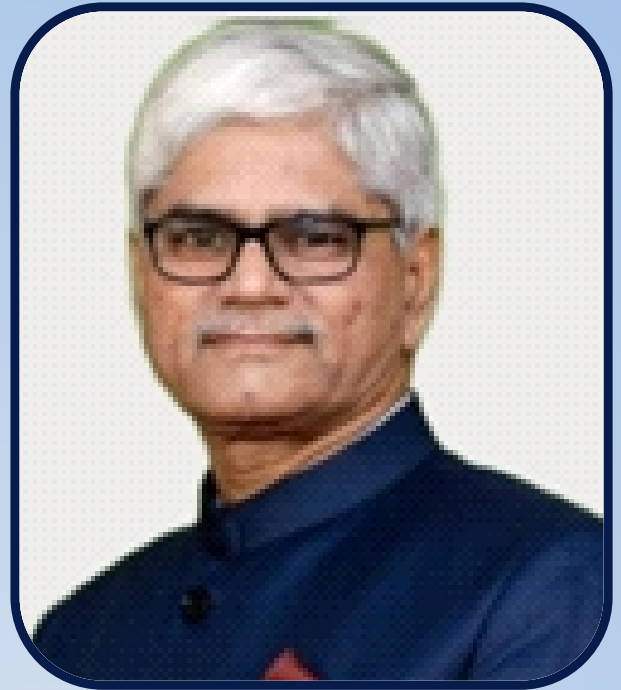
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FROM THE CHAIRMAN'S DESK

It gives me immense pleasure to note that BA College of Engineering and Technology (BACET), Jamshedpur is releasing its inaugural issue of the bi-annual Technical Magazine "SPECTRUM".

The ultimate aim of the college technical magazine is showcasing future direction in which the institute is moving to achieve academic excellence and meet its stated vision & mission statements. College magazine is a college-guide featuring its initiatives of fostering the technical skills in respective technical field, providing articles on academic advice, career tips, student success stories, celebrity interviews, etc.



Future skills and knowledge are very important building blocks of any technical institution and are valuable assets for creating and sustaining competitive advantage. Thus, BACET is focussing on Research & Development activities by deep-diving into specific technologies, developing future skills amongst faculties & students required by the industries & society, and promoting technological innovation and incubation of start-up ideas to address industries as well society's needs & challenges.

I am confident that this Technical Magazine "SPECTRUM" highlighting various initiatives and information, will make interesting reading and stimulate thoughts towards educational excellence.

I wish very happy and prosperous New Year 2024 to all the members of BACET family and all the readers.

Dr. Shio Kumar Singh

Chairman, Board Of Governors,

BA College of Engineering & Technology (BACET), Jamshedpur



THE EDITOR'S NOTE



With the intense effort of the editorial board and the entire team of BACET, our first magazine "SPECTRUM" for the academic year 2023-24 made its release successfully.

At the very onset, I would like to attract the reader's focus towards the aim of publishing this yearly magazine which is to collectively showcase the technical quotient along with the artistic flair of BACETians in a profound and scholastic manner.



The name "SPECTRUM" perfectly fits our magazine since it is a consortium of different frequencies. This magazine provides a platform for BACETians to explore their hidden talents and provide the readers remarkable insights from the world of technology and literature. I hope this initiative builds teamwork and inspires young minds by providing large visibility and dimension.

"Hide not your talents, they for use were made. What's a sundial in the shade?"

-Benjamin Franklin

*With warm regards,
Anumita Sen Gupta
Editor-in-Chief*



Vision

Vision

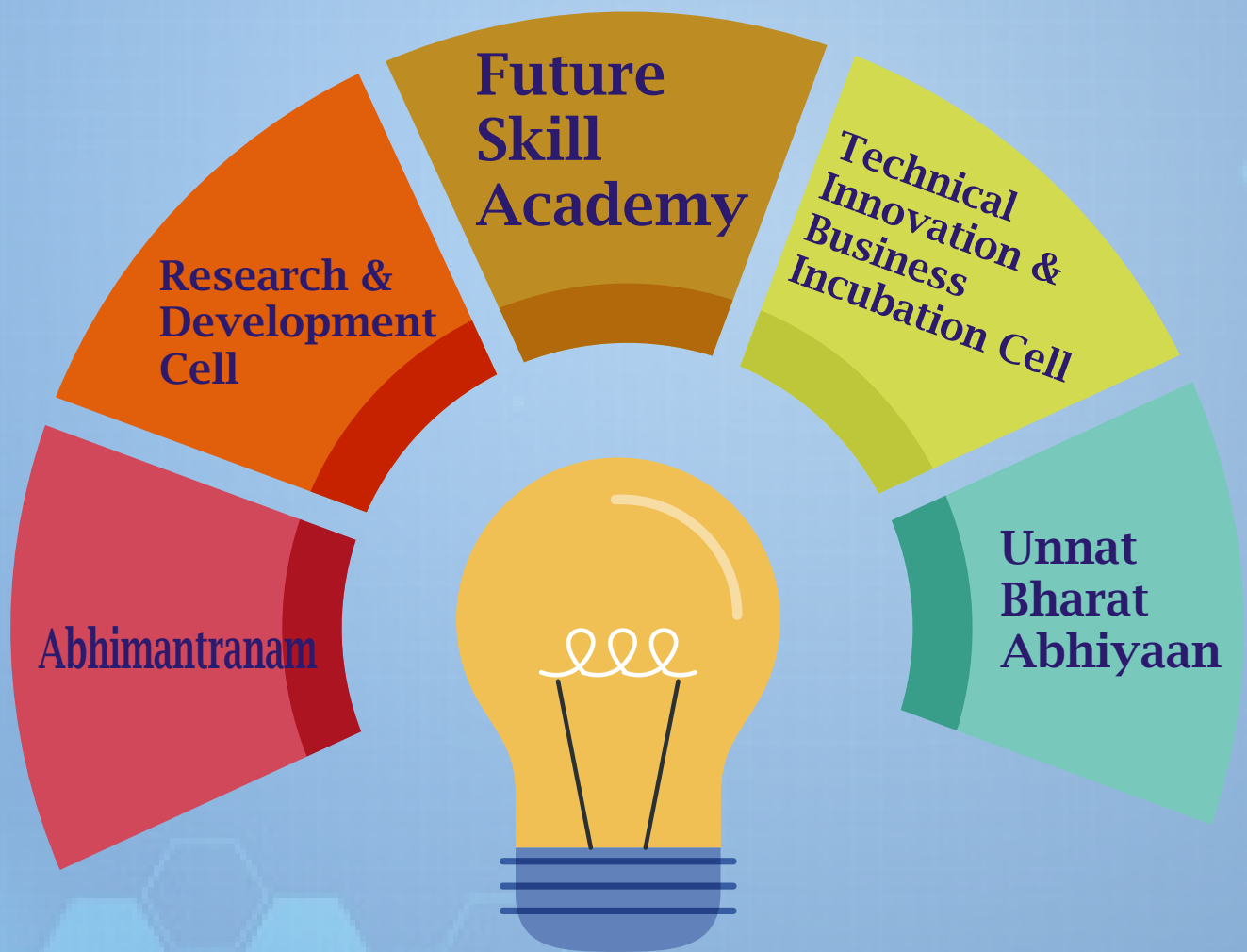
Our Vision is to be a premier centre of Technical & management Studies through excellence in Engineering Education and research, thereby producing global leaders to meet current and future challenges of industry & society



Mission

- 1. To empower learners by providing best technical education with leadership and professional skills.**
- 2. To provide “Education for Living and Livelihood” by focusing on the inculcation of the human moral values.**
- 3. Enable students for deep learning, rational thinking and flair for entrepreneurship through industry institute interaction.**

BACET Initiatives





Future Skill Academy



“Never chase opportunities, let it come to you by creating value and building rare skillsets”
Skill development is an important aspect of India's youth development. It refers to identifying the skill gap and developing those skills to execute the plan with success. In goal achievement, the skills are your tools. The house is your goal. Just as you need the right tool to build a house, you need the right skill to build your goals.

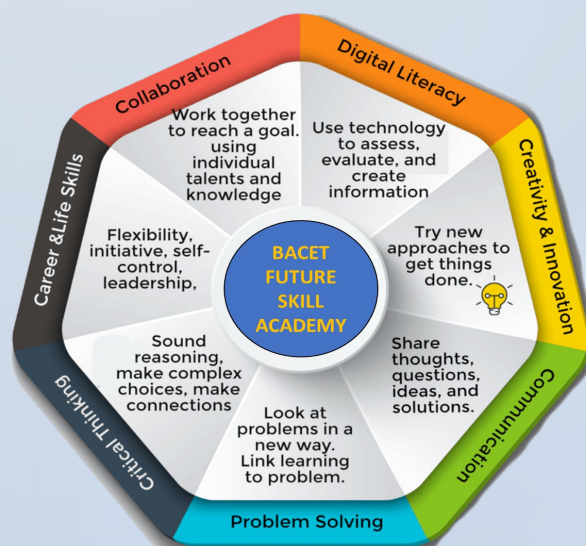
At BACET FUTURE SKILL ACADEMY, we aim to bridge the gap between our formal education system and current industry requirements.

Our course motivates students/faculties to think, analyze, and apply the thoughts and insights they learned. Our academy will comprise Programs containing both technical and managerial courses to ensure that the skilled candidate is guided to the right industry in the market.

Objectives:

To strengthen the capacity of both faculty and students for a sustainable future. Our specific actionable objectives are as follows:

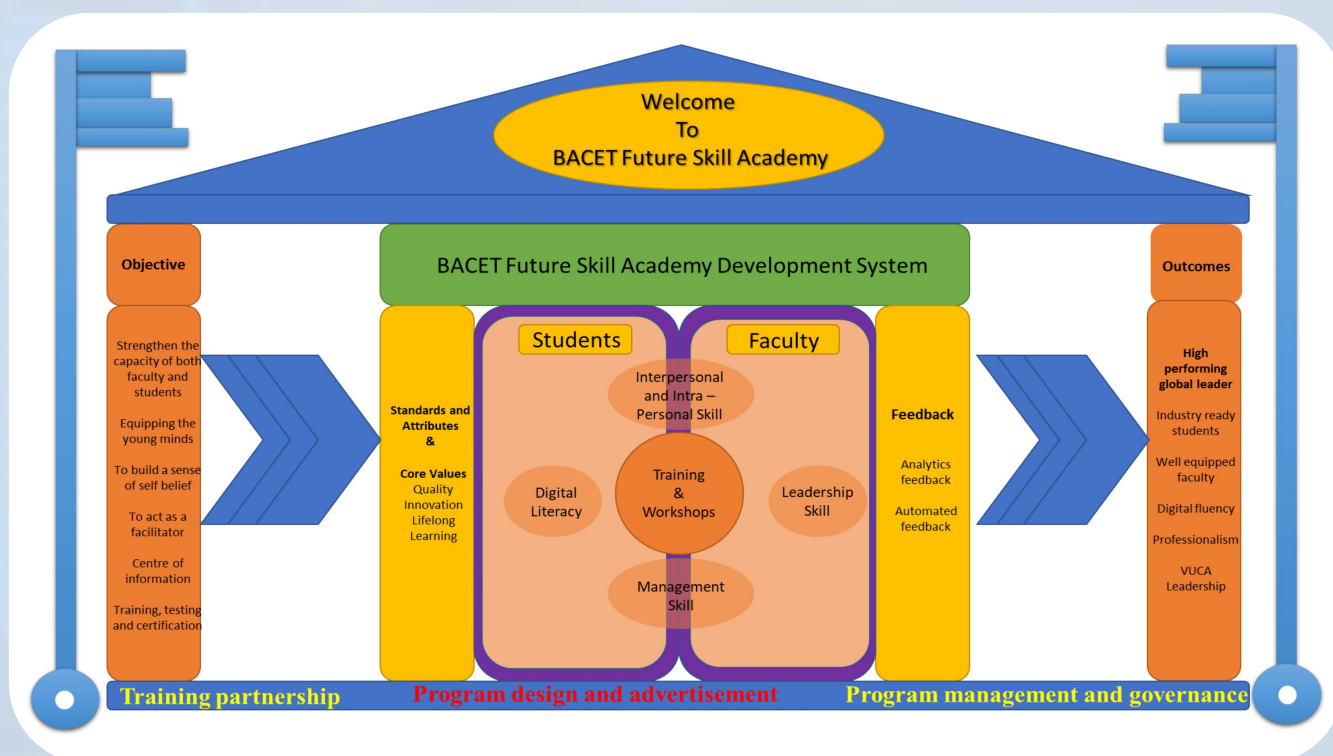
- Equipping young minds with the skill sets to make them the major driving force for technology innovation and economic development.
- To build a sense of self-belief among the vulnerable unemployed youth through sustainable employment opportunities.
- To act as a facilitator to bridge the gap between demand and supply of skilled workforce in industries.
- Impart skill oriented short duration training for students and faculty to help them in developing their technical and professional skills.
- To act as a Centre of information, guidance, and facilitation for students and faculty.
- To disseminate knowledge and appropriate skill practices through recognized systems of training, testing, and certification to validate competency levels.





To achieve these objectives, we are focusing on different areas for Skill development:

- **Artificial Intelligence & Machine Learning**
- **Cyber Security**
- **Cloud Computing**
- **Project management**
- **Critical Thinking**
- **Robotics**
- **Internet of Things**



PRIYA RAHUL

Co-Ordinator

BACET Future Skill Academy



Technical Innovation & Business Incubation Cell

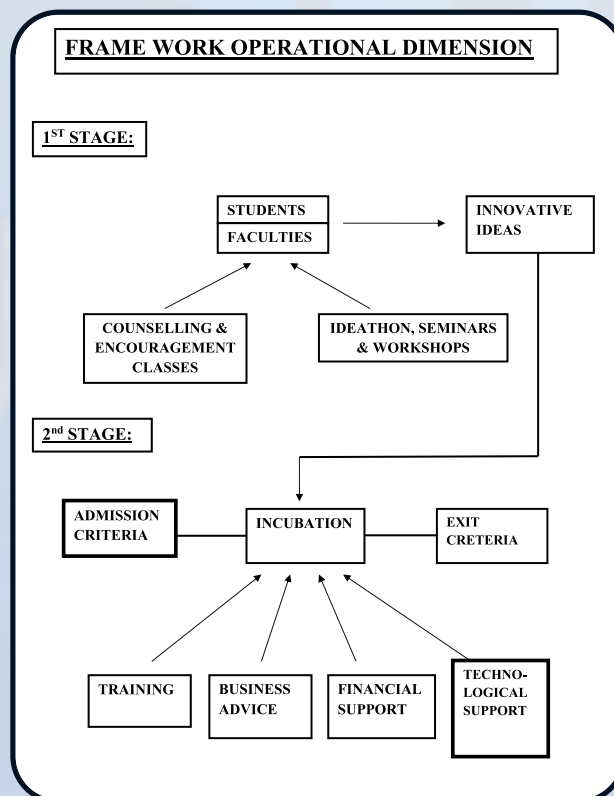


TIBIC :

The TIBIC (Technical Innovation Business Incubation Cell) will encourage the Students and Faculties to innovate new technical things using the facilities (pre-incubation and Incubation) available which will help the Students to generate start-ups to full-fill Industry and society needs.

Purpose:

- 1). Inculcate (idea, attitude or habit) of Job creating mind set from Job Seeking mind set.
- 2). Young mind to convert their highly innovative ideas into viable & useful business propositions.
- 3). Facilitate a platform for growing entrepreneur to start a business venture.
- 4). Use of New Technologies to
 - i). Differentiate themselves from competitors,
 - ii). Become efficient and
 - iii). Ultimately drive growth & Success.





FUTURE PLAN:

The future plan is to develop an Incubation Centre where the Students can Nurture New Ideas & develop that mainly in the field in New Technologies. This incubation model consists of pre-incubation, incubation after care stages. Incubation itself provides following practices:

- (a) Training,*
- (b) Business advice,*
- (c) Financial support,*
- (d) Technology support,*
- (e) Physical space,*
- (f) Networking.*

1). As we have organized Innovative sessions functions, programs and seminars on auspicious occasions where students have made Innovative models and Ideations like “Abhimantranam 2023” in which students have given Innovative ideas on Innovation , the future plans to develop or organize more encouraging sessions to encourage the students where they can develop innovative models for full-filling the marketing challenges. We have planned for innovative Sessions in the following months:

- a). March'24*
- b). June'24*

2). As we have received a number of Ideas, the later stage is to develop and Implement those ideas (within the cost limits). This will also make the students exposed to the various start-ups and to techno-commercial skills by May'24 which will make them future ready professionals.

The startup stages of a startup with venture capital funding:

- 1). Ideation*
- 2). MVP*
- 3). Investment*

Rahul Singh
Co-ordinator
TIBIC

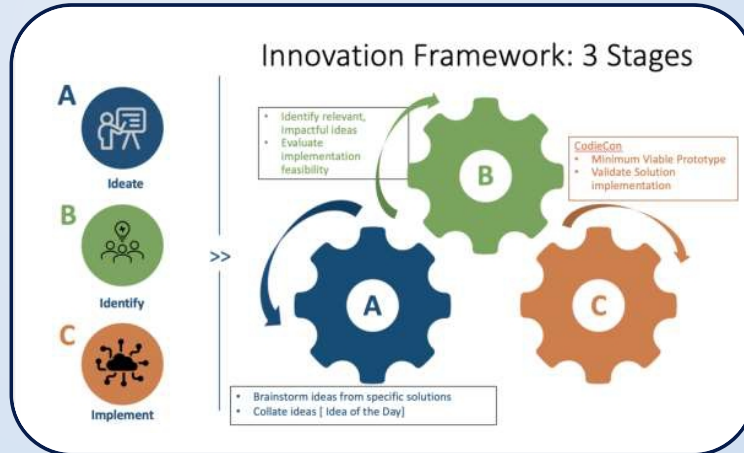
1. Pre-amble:

Entire world is going through wave of uncertainty as the pace of innovation continues to accelerate and technology continue affecting every part of our lives. Automation and Globalization are impacting employment and are also taking over millions of jobs. At the same time, technology is creating opportunities, paving way for new types of jobs and increasing effectiveness & outcomes.

The present students will work in jobs today and many more in the near future, which will require specific skills – a combination of technological knowhow, problem solving and critical thinking as well as soft skills & value systems such as Integrity, Discipline, Agility, Communication and Trust Conduct.

The New Education Policy (NEP) of Govt of India also focusses on such skills. For the socio-economic development, it is therefore important to continuously encourage and nurture the creative minds of the youth to think innovatively and help in transition from Job Seeking Mindset to Job Creating Mindset.

Thus, BA College of Engineering and Technology (Jamshedpur) is starting an Ideathon **अभिमन्त्रणम्** Entrepreneurship Certification program in partnership with M/s SKS Enterprise, Jamshedpur, as its annual event with an objective to give a platform to students for developing and fortifying entrepreneurial quality, passion for integrity and discipline, motivation for achievement and to enable to be independent and capable individual. During this program, students will be exposed to the various nuances of start-ups as well as personal development, techno-commercial skills that are necessary for becoming a Future Ready Professional. A typical innovation framework is depicted below.



2. Eligibility:

All students from technical, professional, general colleges and school (from 8th Std onwards) are eligible to participate.

3. Selection Process:

Ideas will be screened / filtered by panel of qualified judges and top 3 teams will be awarded certificates each year.

The potential start-up ideas will be handhold and facilitated for support from investors to take the idea forward and convert it into reality.

Dr. S. K. Singh

Chairman BA College of Engineering and Technology (BACET) Jamshedpur

Vice President & Head of Education, Bihar Association, Jamshedpur



Research & Development Centre



Introduction

Research and Development Cell (R&D) has been formed in B. A. College of Engineering & Technology which is managed by a chief co-ordinator and other faculty members of the institutions.

Objective

The prime objective of the cell is to promote and to encourage the aspiring students and faculty members to carry out research in the field of science, engineering and technology by providing necessary facilities and infrastructures required for them.

The cell is aimed to have periodical interactive session with entrepreneurs or industrialists.

The cell will further encourage the students for self development training which is taken care by TIBIC cell of the institution.

Present work

Presently, an exploratory research work on nano-composite thin film on stainless steel surface to enhance tribological properties is being processed in our cell.

Also, research work on Electrical Fault Detection and optimization of micro-grid in distributed energy system is under process.

Framework / Way Forward

The future plan of the cell is to collaborate with other intuitions for research related work. Faculties will be encouraged to publish paper in their specific research area.

The cell will arrange brainstorming sessions by eminent personalities from industry, R& D organizations and reputed institutions for the better understanding of research methodology and practices currently followed.

The cell will encourage faculties and students to conduct / participate in workshops, training programs and sensitization programs on capacity building in terms of research and consultancy and imbibing research culture among faculties and students.

Further it will be aimed to conduct research work and survey for identifying entrepreneurial opportunities for our students and to organize talent show, in-house exhibition, business stall, etc.

Framework

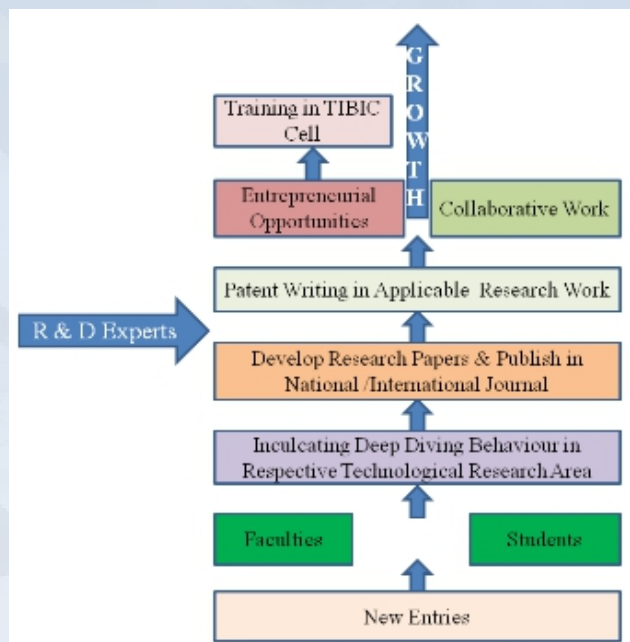
Publications (During 2022-23):

1. Magnetron sputtered films prepared from sintered Ti-based target and evaluation of tribological properties under ball on disc condition with varying thickness and load, Parikshit Mahato, Manilal Murmu, Priyabrata Banerjee*, Suman Kumari Mishra*, *Journal of Adhesion Science and Technology*, 37(8) (2023) 1345-1372. <https://doi.org/10.1080/01694243.2022.2079861> (I.F: 2.431)
2. IEEE STPEC 2023, Conf. Paper: Sanjay Mandal. A Relative Investigation on Different Parameter Extraction Schemes for a Solar Photovoltaic Panel. (Final presentation 12/12/2023).
3. S. Mandal & R. Pradhan: "A Critical Analysis on Different High Impedence Fault Detection Schemes, Electric Power Components and Systems", DOI:10.1080/15325008.2023.228215.

Dr. Dolly Chakraborty

Co-ordinator

Research & Development Centre





Unnat Bharat Abhiyan



About

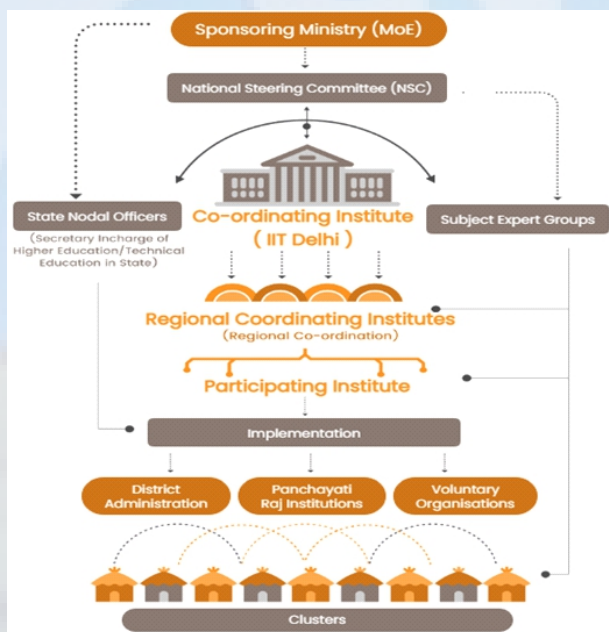
UNNAT BHARAT ABHIYAN (UBA) is a flagship programme of the Ministry of Human Resource Development, with the intension to enrich Rural India. It aims to create a vibrant relationship between the society and the higher education institutes, with the latter providing the knowledge and technology support to improve the livelihoods in rural areas and to upgrade the capabilities of both public and private organizations in the society.

Objectives

- Engage students and Faculty to understand rural realities
- Identify/select /devise innovative technological interventions for the development of rural people as per the requirement
- To contribute to the development of Rural India.

UBA Faculty Team Members

- Mr. Nilay Mandal
- Mr. Sanjay Mandal
- Mr. Tapan Kumbhakar



The Adopted Villages

- Ghutia
- DobhaPani
- Naranga
- Shalbani
- Koriya

The Stake Holders

- MHRD (National Steering Committee)
- JHARKHAND GOVT
- IIT DELHI (National Coordinating Institute)
- NIT JAMSHEDPUR (SEG)
- BACET (PI)
- PANCHAYATH RAJ
- RURAL PEOPLE

Major Themes of UBA

- Organic Farming
- Water Management
- Artisans /Industries livelihood
- Basic Amenities
- Sustainable Energy

Major Steps Involved

- Survey-House Hold Survey & Village Survey
- Prepare Village Development Plan
- Submission of Project Proposals
- Implementation of Project

Village Development Plan

Steps of preparing plan of action:

- Identification of the village and key persons for knowledge input
- Social Mobilization through hamlet meeting and village meeting.
- Conducting primary survey and secondary data collection
- Analysis of data, identification of problem, issues and potential
- Interaction with the villagers and conducting Participatory Rural Appraisal (PRA) for the feedback
- Obtained input from the key persons and preparation of integrated village development plan.



Major Interventions

- AGRICULTURE
- BIO ENERGY
- EDUCATION
- AFFORESTATION
- HEALTH
- DIGITAL LITERACY
- SANITATION
- SKILL DEVELOPMENT ETC
- DRINKING WATER

Highlights

- Develop communication skill, emotional skill, interpersonal skill, organizational skill, problem solving skill
- Job outlook
- Activity points
- Rs. 1 lakh for technological interventions/ solutions
- Rs. 50,000/- for customization of the solution

Progress till date

BA COLLEGE OF ENGINEERING & TECHNOLOGY is a Participating Institution of Unnat Bharat Abhiyan. The institution constituted a team comprising of a general staff coordinator, along with five individual staff coordinators for three villages (Koriya, Narga and Ghutiya) assisted with a team of student's representations for Unnat Bharat Abhiyan programme. In the initial phase, the team has conducted the household survey and village survey and has identified the major problems faced by the villagers & also arrange for seminars, Medical Camp at BACET college campus & in the villages with the village Mukhiyas and village people in the adopted area in the 2022-23 sessions.

Future Implementation

Our coming working progress of the remaining two villages (Salbani and Dobha Pani) we want to check of basic information as per Unnat Baharat Abhiyan. We're also contact to our listed villages panchayat development officer/ Pradhan to get further information identification of problems and preparation of the plan of action/ specialized interventions

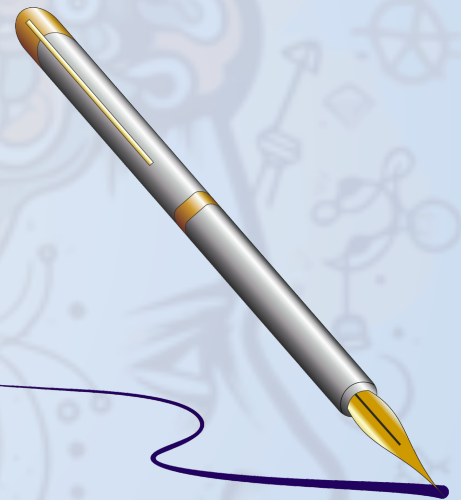
Nilay Mandal

Co-ordinator

Unnat Bharat Abhiyan



Insights Into The Mind



Consistency And Hard Work

It's not the college or school which decides your destiny it's always the tiny effort you put in every day makes you successful. I have heard from many in my time as well as I could feel and experience it that it's not the College or school which plays a role in defining a better career. There might be hundreds or thousands of schools / colleges which provide better education.

It's you who needs to decide in which one you would like to study and make an effort to get into it. Nowadays there are so many examples which prove that consistency and hard work can lead to success. Be it any field, be it finance, engineering, medical, HR, marketing, hotel management, journalism, law etc. So once you are already into the college, give your 100% and you would see the changes in yourself. Set a goal for yourself and work on it every single day and you will find yourself in a better position than yesterday.

It's been said "One can take a donkey to a pond but none can make it drink"

So it's you who needs to work harder and smarter to achieve your goals and none other can.

As it's said Rome is not built in a day similarly in our life if we want to achieve something great we have to give our 100 percent every day.

Swami Vivekananda once said "Stop not until your goal is reached".

I have seen people who become successful in whatever they have dreamt of have been consistent in whatever they did. I believe if you practice being consistent you will be successful.

In one of the books by Joseph Murphy he said we each have the power to achieve anything and everything.

If ever you get time do read the book "The power of your subconscious mind"

written by Sir Joseph Murphy. It's a wonderful book. It not only motivates you to think positive but also helps you to achieve every big thing you have ever dreamt of.

Keep studying and engage yourself with those people who have a similar kind of dream or a higher than yours.

Here's a poem I have written for you

If you keep on going you will reach

Alone you travel the unseen path

Success is all you desire since birth

when you come across darkness

At times you lose all your happiness

With courage again you rise

And let go of your fear which lies

It's not the challenges which you fear

Failure makes you break into tears

Well if you keep going on

You will reach one day

Success will come your way

And that's all I have to say.

Thanks

Teena Mahato

Lecturer, BACET

Education Way to Excellence

Swami Vivekananda famously said –Education is not the amount of information that is put into your brain and run riots there undigested, all your life. We must have a life building and character making assimilation ideas.

Education is not simply imparting knowledge in a particular faculty or subject for a brilliant performance in examination or securing a high profile job, but at the same time education also means total self development, enabling an individual to face the challenges of life in ever changing environment.

The Objective

Education should aim at elevating the quality of human life not only through economic upliftment but also through social, moral and spiritual strengthening. This holistic approach will help to attain true enlightenment - Tamaso Ma Jyotirgamaya, i.e, from darkness to light.

Education should not be viewed only as a means for economic development, but it also enables a human being to realise his or her potentialities. An integral education should provide all-round human development with the highest objective - spiritual awakening.

According to Sister Nivedita (apart from Vivekananda's noted disciple, she was an eminent educationist), "The contents of education - curriculum, subjects, etc. are of secondary importance only, the most significant part of education is the idea that is to guide the direction of rest of one's life is the discovery of the purpose of life, which can never be self centered. The other contents are merely a preparation for this. A nation stands or falls in the long run by the number of such men of character that she is capable of producing out of the rank and file of ordinary education."

Self Development

Our ancient history reveals that India always had a rich tradition of learning and education. In our ancient system, training of the mind was considered as the principal objective of education. Ancient Indian education system was established on the logical basis that, there can be no knowledge without concentration of the mind. We only discover the knowledge which is already in the mind and not learning anything new. The process of acquiring knowledge is nothing but gradual unfolding of the secrets of nature, and the secrets of nature are revealed only in a calm, undistracted and concentrated mind.

Development of mind should be of primary importance in education. Human mind is the principal instrument for acquiring knowledge; therefore a well trained mind can acquire knowledge on its own. Education should include intellectual, moral, aesthetic and spiritual aspects of life for the expression of his or her inner consciousness.

The power of introspection should be developed and the thought process should be directed to achieve higher values. By actual observation a person can find his own attitudes and aptitudes, his own excellences and weaknesses, and map out a life for the development of his potentialities. Human problems basically psychological and not biological, therefore we must look at our already existing inner resources, developing them to the highest possible level to overcome the limitations for the achievement of the goal of human life. Education is an endless journey through knowledge and enlightenment. Real education enhances the dignity of a human being and a transformation from what can I do for me to what can I do for you. It is a sense of oneness with others, it is an expansion of our narrow sense of the self to include the whole universe as an extension of ourselves.

Sister Nivedita said: It is through out the early years of education to remember that there is nothing so important as the training of the mind to feel for others. To feel nobly, loftily and honestly is a thousand times more important than any other single aspect of the educational process. A child in whom this quality is present will always do the best thing under any given circumstances. In ancient India, (Vedic and post Vedic period) there were well defined methods to train the mind for the awakening of moral and spiritual values to the highest extent.

Moreover, from a national as well as global perspective, cultivating moral and spiritual values are more relevant today than it was ever before. A true education is all about enabling the mind to right choice and act accordingly. Right choice is guided by spiritually i.e., a choice not for self interest, but a choice for the benefit of each and every person concerned. The choice between self interest and collective interest are always going to be very tough, it requires determination, courage to stand against all odds and constant struggle. It is this struggle for the manifestation of divine potentiality in every man or woman which leads to human excellence that makes for true education.

Nation Building

Education plays a pivotal role in the development of a country in every aspect, - social, cultural, intellectual and moral. The overall development of a child or a person is very important for nation building and progress. According to Swami Vivekananda: Three things are necessary to make every man and every nation great

Conviction of the powers of goodness

Absence of jealousy and suspension

Helping all who are trying to be good and do good

As a nation we need to create educated and creative personalities based on strong moral and spiritual values.

By reviewing the present scenario regarding education in India, we may have the highest number of graduates in the world, but their knowledge has not translated into innovation. Some of the problem areas in our system needed to be addressed:

1. To correlate education with the problems of life.
2. To democratize education.
3. To cope with the problems arising out of modern scientific and technical advancements.
4. To make education adequately efficient.

Childhood is the foundation stone upon which stands the whole life structure, as the seeds sown in childhood blossom into the tree of life. Education which is imparted in childhood, at every stage development of mind is more important than the education received in academic institutions. A value based education in the school campus is essential to establish an open and transparent society. Emphasis should be on exploration, innovation and creativity through active participation.

Dr.A.P.J. Abdul Kalam has explained the role of education towards nation building in the following points:

1. To build character and cultivate moral and spiritual values in students
2. To encourage creativity and develop scientific attitude with spiritual foundation
3. To enhance learning capacity through technology
4. To build confidence among children to face the challenges of life
5. To ensure enlightenment of the soul
6. To encourage innovation and develop research aptitude among students
7. To develop moral leadership
8. To develop sense of dignity, self respect and self reliance among students.

In his words, When learning is purposeful creativity blossoms, when creativity blossoms thinking emanates, when thinking emanates knowledge is fully lit. Our educational methods should strive to develop the facilities of thinking, feeling for others and a strong determination to serve the purpose of human existence i.e. the realization that we live for others. Swami Vivekananda said: They only live, who live for others, rest are more dead than alive. We need to think ways in which our present education can be humanized along the lines - Humanity is not physical entity, humanity is all about mind soul, if the blossoming of mind is stopped, humanity will never realize its actual potential. The result will be unspeakable ruin (spiritual death).

Conclusion

Ultimately education in its real sense is the pursuit of truth. It is an overall development of the self where there is no room for pettiness and disharmony.

If only the real sense of education could be realized by each individual and carried forward in every field of human activity, the world will be a much better place to live in.

Dr. Dolly Chakraborty
Principal, BACET

BACETian Experience



One of the most interesting stages in life that gives you an opportunity to explore is the 'college phase.' Life at college is the time when the teenage years end and we all dive deep into the ocean of new beginnings and possibilities. This golden period better equips you for all the challenges you'll face in life and creates a strong foundation of knowledge.

My experience at B.A. College of Engineering & Technology has taught me one fundamental thing – life is unpredictable. It might be good, it might be bad, it might be weird, and it might not interest you, but expect anything to happen. For example, you might have a wonderful job this moment, and be fired the very next moment. College life prepares you for all of this. It is a perfect blend of joy and hardships. You meet different people, you interact with them, and you learn about their cultures and grow as a person. You will understand how to talk to different people, how to judge their behavior, thus helping you with important life skills.

You learn to sit through a boring lecture; you try to cope up with the surprisingly strenuous syllabus, and you have the opportunity to learn from some great research minds. Academia, as they say, never lets you go free. People might try to motivate you by telling that you need to study only through your school years and chill during the college life, but that isn't true.

Another life lesson you will remember – the learning never ends. You find campus groups or student groups where you can explore your co-curricular skills along with many other students like you. So, one fine day when you see pictures from the college of you and your friends having a good time, you'll definitely land up smiling silently. That's the beauty of college life. It stays with you long after you've climbed those ladders of success and forgotten the name of that cute crush you used to drool over.

PUJA KUMARI

(Assistant Professor)

Electronics & Communication Engineering

B.A. College of Engineering & Technology

1. Introduction

The Laplace transform is an integral transform named after its discoverer Pierre-Simon Laplace. It takes a function of a real variable t (often time) to a function of a complex variable s (frequency). The Laplace transform can be viewed as a continuous analogue of a power series. It transforms a differential equation to an algebraic equation.

2. History

The early history of Laplace Transform was started from 1744, when Leonhard Euler investigated integral of the form

$$z = \int X(x)e^{ax} dx \quad \text{and} \quad z = \int X(x)x^A dx$$

As the solutions of differential equations. Joseph Louis Lagrange also investigated expression on the form

$$z = \int X(x)e^{-ax} a^x dx$$

in his work on probability density function which some modern mathematician interpreted within modern Laplace Transform theory.

These types of integrals attracted Laplace's attention in 1782, when he was using the integral as the solutions of the differential equations. However, in 1785, Laplace took the critical step forward when, rather than just looking for a solution in the form of an integral, he started to apply the transforms to transform the whole of a difference equation. He then went on to apply the Laplace transform in the same way and started to derive some of its properties. The theory was further developed in the 19th and early 20th centuries by Lerch, Heaviside, and Bromwich.

Contribution of Heaviside

He invented the Heaviside step function using it to calculate the current when an electric circuit is switched on. He was the first to use the unit impulse function now usually known as the Dirac delta function. The current widespread use of the transform (mainly in engineering) came about during and soon after World War II, replacing the earlier Heaviside operational calculus.

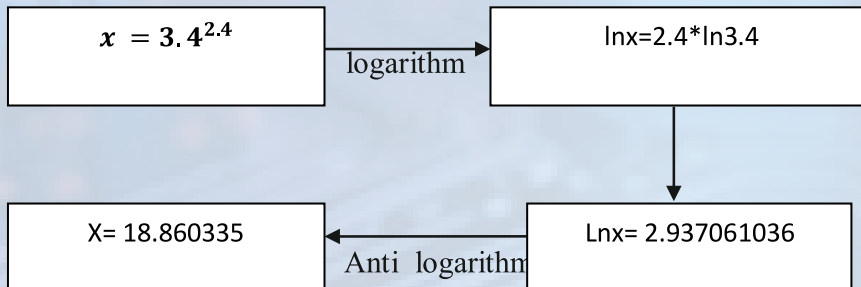
3:Origin of Laplace Transform

Example (1) Let us consider the following simple computational problem

$$x = 3.4^{2.4}$$

To get the exact answer , we have to use either a calculator or logarithm .

We show how the logarithm can be used as a transformational tool .



Example (2) Let us consider the following system of linear Equations

$$a_{11}x_1 + a_{12}x_2 + a_{13}x_3 = d_1$$

$$a_{21}x_1 + a_{22}x_2 + a_{23}x_3 = d_2$$

$$a_{31}x_1 + a_{32}x_2 + a_{33}x_3 = d_3$$

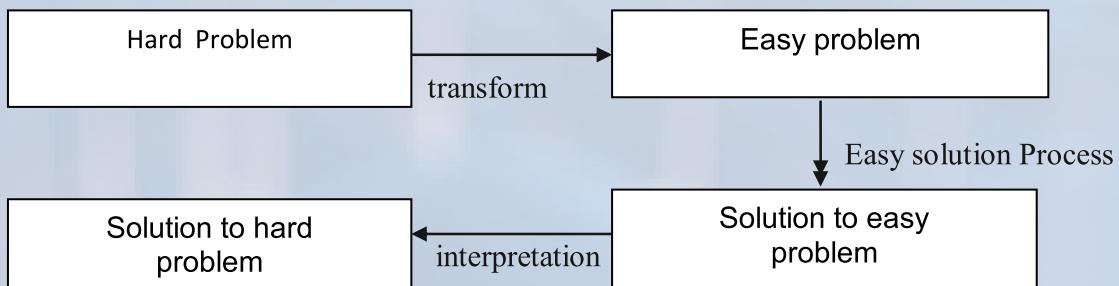
the solution of a system of equations by Gaussian elimination works by transforming the original system into the following equivalent system

$$a_{11}x_1 + a_{12}x_2 + a_{13}x_3 = d_1$$

$$b_{22}x_2 + b_{23}x_3 = e_2$$

$$b_{33}x_3 = e_1$$

By the back substitution process we can get the values of x_1, x_2 & x_3 easily . The concept of solution through transformation can be illustrated with a simple diagram below.



The above two examples illustrate, how the process of transformation is useful to get a solution for the problem difficult to be solved.

4: Power Series = Discrete Summation

We are familiar with the following power series

$$\sum_{n=0}^{\infty} a(n)x^n = a(0) + a(1)x + a(2)x^2 + a(3)x^3 + \dots \dots \dots (4.1)$$

Where $a(n) \in R \quad \forall n \in W$

5: Integral = Continuous Summation

If the discretely defined function $a(n)$ is replaced by continuous defined function $f(t)$ and discrete independent variable n is replaced by continuous independent variable t , then the above discrete summation is replaced by integral

$$F(x) = \int_0^{\infty} f(t)x^t dt \quad , \text{ where } f(t) \in R \quad \forall t \in (0, \infty) \dots \dots \dots (5.1)$$

$$F(x) = \int_0^{\infty} f(t)e^{t.lnx} dt \quad , \text{ Since } e^{lnx} = x \dots \dots \dots (5.2)$$

6: Condition for Existence of Integral

The integral given by the equation (5.2) exists if the function $f(t)$ is piecewise continuous & $f(t)$ must be locally integrable on $[0, \infty)$. For locally integrable functions that decay at infinity or is of exponential order.

Piecewise continuous

A function f is piecewise continuous on the interval $[a; b]$ if

- (i) The interval $[a; b]$ can be broken into a finite number of subintervals $a = t_0 < t_1 < t_2 < \dots < t_n = b$; such that f is continuous in each subinterval $(t_i; t_{i+1})$; for $i = 0; 1; 2; \dots; n - 1$
- (ii) The function f has jump discontinuity at t_i , thus

$$\left| \lim_{t \rightarrow t_i^+} f(t) \right| < \infty \quad , i = 0, 1, 2, 3, \dots, n-1 \quad ; \text{ and}$$

$$\left| \lim_{t \rightarrow t_i^-} f(t) \right| < \infty \quad , i = 0, 1, 2, 3, \dots, n.$$

Exponential Order

The function $f(t)$ is said to be of exponential order if there exists a positive number M , a number α & a number t_0 such that

$$|f(t)| \leq Me^{\alpha t} \text{ for } t > t_0$$

Example

1. Every bounded function on $[0, \infty)$ is of order zero.
2. The exponential order of $f(t) = e^t$ is of order 1.
3. The function $h(t) = e^{t^2}$ is not of exponential order.
4. The function $g(t) = 2^t$ is of exponential order 1.

The integral (5.2) exists if the function $f(t)$ is piecewise continuous and is of exponential order

Now, taking modulus of the equation (5.2)

$$\begin{aligned} |F(x)| &\leq \int_0^{\infty} |f(t)| e^{t \ln x} dt \\ \Rightarrow |F(x)| &\leq \int_0^{\infty} M e^{\alpha t} e^{t \ln x} dt \\ \Rightarrow |F(x)| &\leq \int_0^{\infty} M e^{(\alpha + \ln x)t} dt \\ \int_0^{\infty} M e^{(\alpha + \ln x)t} dt &= \begin{cases} \infty & \text{for } \alpha + \ln x > 0 \\ \frac{M}{\alpha + \ln x} & \text{for } \alpha + \ln x < 0 \end{cases} \end{aligned}$$

It is obvious that $\ln x$ is negative so let $\ln x = -s$, where s is a +ve number

7: The Formal Definition of Laplace Transform

The Laplace Transform of $f(t)$ is defined as follows

$$L\{f(t)\} = F(s) = \int_0^{\infty} f(t) e^{-st} dt, \text{ where } s = -\ln x$$

8: Application

The Laplace transform is a widely used integral transform with many applications in physics and engineering. It helps us to solve Differential Equations and integral equations in an easy way by transforming Differential Equations into algebraic equations. It is also used to evaluate definite integrals, boundary value problems. In physics and engineering, it is used for analysis of linear time-invariant systems such as electrical circuits, harmonic oscillators and optical devices.

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Impact of Cyber Crimes on Indian Cyber Security



Abstract: Cyber security is concerned with making cyberspace safe from threats, namely cyber-threats. The notion of "cyber-threats" is rather vague and implies the malicious use of information and communication technologies (ICT) either as a target or as a tool by a wide range of malevolent actors. The 20th century has brought to reality the idea of a global village, where digital technology has interconnected and enmeshed the world economies, cultures and populations. India is no exception, with over 560 million internet users as of 2020, making it the second-largest internet population in the world. While greater connectivity via the World Wide Web (www) promises large-scale progress, it also leaves our digital societies open to new vulnerabilities. "The cost of doing business in the digital age is to protect our IT systems and investments, and the economic impact of cyber crime should be one of the most important things businesses are focusing on because failure to protect their intellectual property [IP], financial information and IT networks does have an economic impact."

Keywords: Cyber Attacks, Cyber Crimes, Consumer trust, National Security, IP.

1. INTRODUCTION

Cyber security is concerned with making cyberspace safe from threats, namely cyber-threats. The notion of "cyber-threats" is rather vague and implies the malicious use of information and communication technologies (ICT) either as a target or as a tool by a wide range of malevolent actors. As commonly used, the term "cybersecurity" refers to three things:

A set of activities and other measures, technical and non-technical, intended to protect computers, computer networks, related hardware and devices software, and the information they contain and communicate, including software and data, as well as other elements of cyberspace, from all threats, including threats to the national security;

The degree of protection resulting from the application of these activities and measures;

The associated field of professional endeavour, including research and analysis, aimed at implementing and those activities and improving their quality.

Cybersecurity is thus more than just information security or data security, but is nevertheless closely related to those two fields, because information security lies at the heart of the matter.

2. DISCUSSIONS

The increasingly liberalized nature of the economy, rapidly changing technology and newer business models are taking utmost advantage of the process of globalization. IT has become central in fulfilling the organizational mission. However, most organizations, whether large or medium, continue to deploy and operate systems to meet their business objectives without fully appreciating the need

for effectively governing enterprise-wide information security (IS). Cyber crimes know no borders and evolve at a pace at par with emerging technologies. According to researchers, too much attention is paid to which country or cyber crime group is behind attacks to identify who is to blame, whereas the more important focus should be on the economic impact, how that can be reduced and the return on investment in cyber defenses. "The reality is that cyber crime is just an evolution of traditional crime and has a direct impact on economic growth, jobs, innovation and investment," he said. "Companies need to understand that in today's world, cyber risk is business risk." IP theft alone accounts for at least 25% of the cost of cyber crime and threatens national security when it involves military technology, the report said. "IP theft and loss of opportunity are two areas of cyber crime impact that are extremely difficult to measure, but we have seen that IP theft and lost opportunities can be fatal for companies, especially for small and medium-sized businesses," said business executive. Cyber attacks in the country caused financial damages to the tune of about USD 500,000 to India companies in the last 12-18 months, says a study.

3. APPLICATION OF THE CYBER SECURITY THEORY

E-Governance applications are becoming more and more pervasive in India. They are beginning to touch citizens' lives in many ways – be it Unique Identity, passport issuance, immigration control, driving license or vehicle registration certificate; filing of income tax returns; land records, and many more. Many of these could be categorized as mission critical. Networks are being rolled out for all these projects. All industry be it banking, telecom or others rely heavily on IT infrastructure and use them for providing services to the end customers. While technological innovations in these IT systems are continue to happen, it is important that best practices for security and privacy are implemented by industry to providing a feeling of trust to their customers, consumers and citizens. Securing information systems is an enormous task that places ongoing responsibilities on both the government user agencies as also on the service providers who must act as their partners in secure delivery of services, to authenticated users with assurance for integrity of data. These applications and infrastructure store enormous amount of personal information and it becomes imperative to protect the privacy of individuals whose data are stored in these applications.

4. RESEARCH METHOD

The survey research method is used because bias was less likely as subjects were randomly assigned to treatments, and subjects and researchers were blind to the identity of the treatments. Questionnaire and interview were used for data collection. Researcher developed questionnaire on the basis of literature and related researches.

5. PROCEDURE

The researcher collected the data from the respondents through email and direct from the interview after the distribution of questionnaires to the five educational institutions and scoring was done after the collection of data. Five point rating scale was used to record score of all positive statements ranged from 5-1 for different response categories. Strongly agree (SA), Agree (A), Undecided (U), Disagree (DA) and Strongly Disagree (SDA). The data was analyzed in terms of percentage.

6. CONCLUSION

Recent studies published on the evolution of principal cyber threats in the security landscape. They present concerning scenarios, characterized by the constant growth of cybercrimes activities. Even though the level of awareness of cyber threats has increased, and law enforcement acts globally to combat them, illegal profits have reached amazing figures. The impact to Indian economy has become unsustainable, considering the global economic crisis. It's necessary to work together to avoid the costs the global community suffers, which we can no longer sustain. The risk of business collapse is concrete, due to the high cost for enterprises in mitigating counter measures, and the damage caused by countless attacks. Now a day's customers have come to expect that organizations have a presence on the Internet, including a website and e-mail capabilities. Use of the Internet is a risk that most companies have to take. The problem is to minimize the risks associated by so doing. If there is no technology, hopeful the cybercrimes would not be found anywhere.

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The Enduring Role of the College Library in the Digital Age

In today's technology-driven world, one might assume that the traditional college library is a relic of the past. However, despite the rise of digital resources and online learning, college libraries remain essential hubs of academic life, providing students with a wealth of resources and services that are crucial for their success.

College libraries offer a vast collection of books, journals, and other materials that span a wide range of disciplines. This comprehensive collection provides students with access to the information they need to conduct research, complete assignments, and expand their knowledge. In addition to physical materials, college libraries also provide access to a wealth of electronic resources, including online databases, journals, and eBooks. This digital collection allows students to access information from anywhere in the world, at any time of day or night.

Beyond providing access to information, college libraries also offer a variety of services to support student learning. These services include research assistance, reference services, and instruction in information literacy. Librarians are experts in helping students find, evaluate, and use information effectively. They can provide assistance with research projects, help students locate specific materials, and teach them how to navigate the vast world of information.

In addition to these traditional services, college libraries are also embracing new technologies and offering innovative services to meet the needs of today's students. Many libraries now offer makerspaces, where students can use digital tools and equipment to create their own projects. Libraries are also offering more online services, such as virtual reference chat and online tutorials.

While technology has undoubtedly changed the landscape of higher education, the college library remains an essential institution. College libraries provide students with the resources and services they need to succeed in their studies, and they play a vital role in fostering a culture of learning and inquiry.

*Sanjay Kumar Gupta
Librarian*

For The Love Of Physics

Ever since man has learn , Almighty had supplied him with wonderful commodity , a great mind , that bloom ideas , emotions and the capability to think what is going on around him . Among all the creatures in this world humans are the only ones who have dominated this globe for centuries . This is because they are able to think rationally , sighting reasons for their understanding . And this seed of understanding get its source from a very well known subject that's physics.

It enables us to describe the working , phenomenon and coordination of this whole universe . It shows us the law that governs the entire universe. The subject has made our ideas more relevant and more clear about our understanding the nature . But on my part I do not consider it as a subject rather I consider it as my passion which I want to grows . Now first let me put some amazing facts before you . Physics is categorised as an classical subject going on for ages . Though started in an early age , but the scientific revolution started at the time of Sir Issac Newton , who made great discoveries and contributed a lot to this field . Now in every aspect of our life we experience the importance of physics , whether it is communication transports , warfare , researches and many more. The beauty about physics is that it is real not fictions and there are several reasons and ways to prove it so . Even brushing your teeth , playing football , chewing your food , and other everyday works , all involves physics . Even sitting idly on a chair , also involves physics , scientists all over the world are sweating day and night cracking their brains to achieve remarkable theories , to complete the idea of physics . It is due to the knowledge of physics only that we are able to clear the skies and reach the space. The reason why I am addicted to it is because it's preaches and prophets also influenced me a lot . Once Albert Einstein carried out a dangerous demonstration to prove one of his theories , and he succeeded . At last he proudly commented that physics work and he is still alive .

Truly I consider it as a most amazing subject and I wish that everybody should take interest in it . I passionately love physics .

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Roll No : BCA / 02 / 22

Semester : 3 rd

The Student i.e. Vidyarthi – Vidhya means knowledge and arthi means one who desires knowledge.

काक चेष्टा बको ध्यानं, श्वान निद्रा तथैव च ।
अल्पहारी गृह त्यागी, विद्यार्थी पंच लक्षणं ॥

This Sanskrit Shloka describes the five qualities that a student must possess: Kaka Chesta (The efforts of a Crow); Bako dhyanam (The focus of a Crane); Shwan Nidra (The alertness of a Dog); Alpahaari (Inputs we give to our senses) and Gruha Tyagi (Leave the home i.e. comfort zone).

Student life is one of the most memorable phases of a person's life that builds the foundation of our life. During this phase, we learn to grow emotionally, physically, philosophically as well as socially. The student life is also a life of struggling but ample with hard workings, entertainments, problems and challenges etc. It is inevitable that being a student they face various challenges, getting a good job is one of such a biggest challenges for them. But face the challenges and beat the challenges they must know. It is observed now a days that some common problems they face as- first, "Suicides among students"- according to the Lancet, India has one of the world's highest rate of suicides among the students aged ranges from 15 years to 29 years old and the reasons behind such a heinous act may be due relationship failure, exam pressure, family pressure and failure in desire for highly-paid jobs etc. Albeit whatever be the reasons, solutions should be underlined to overcome such a suicidal thoughts as one should never have a single option in one's carrier, don't be a part of a mob competition and to find some new great ways in the college life. Second, "Problems in managing study well"- we all have different capacity and ability to learn and understand the things. Some people are quick in learning and some others take the time. It is absolutely fine when you (student) try to learn things and it doesn't come easy for you to understand and memorize them. Drawing up a better time schedule primarily in between your study time and time for other activities like daily routine work, sleep, sports, some leisure time for refreshment or anything else may lead to avert the situation when you feel like overburdened. Third, "Various distractions for students"- the biggest distractions students facing-Social media, Drugs, Drinking, Smoking.....& Sex.....Some medical conditions like hormonal changes during student life cause frequent mood changes and cause loss of attention doing something. Interacting with good learned people and playing games may help in diverting your mind and energy towards a healthy lifestyle and it will make you mentally fit too. Fourth, "Stress and depression"- generally, most of the students are found under grip of stress and depression caused by irregular sleep and eating habits that turns their life up as a nightmare. Due to that they feel like irritated all the time, loss of concentration, drinking, drugs, regular fights and more symptoms shows their psychological and physical health. So, doing meditation and taking exercise regularly, eating healthy foods, reading books and novels, listening music, playing a musical instrument etc. may be the better solutions to cope with such conditions. Fifth, "Financial issues in college life"- the financial issue is the integrated part of the problem related to study in today's time where the cost of study has risen multi-fold. Students run into this issue throughout their college carrier and sometimes they forced to dropout because they can't afford it. So, the needs of the hour is that they should manage some financial resources. The only solution is to earn some extra money by finding some freelancers jobs and get a part time work. Sixth, "Student life relationship problem"- student life relations are considered as most fluctuating as they keep on trying and learning new things about relationships. They need some healthy relations as FRIENDS in their college time so that someone is here to care them, whom with they can share their good and bad moments.

Seventh, "Lack of confidence and communication skills"- Students should try to talk and open up themselves for conversations, group discussions, speeches, lectures, games and lot more as this will help them to socialize with people in professional and personal life as well as boost their confidence and enhance their communication skills.

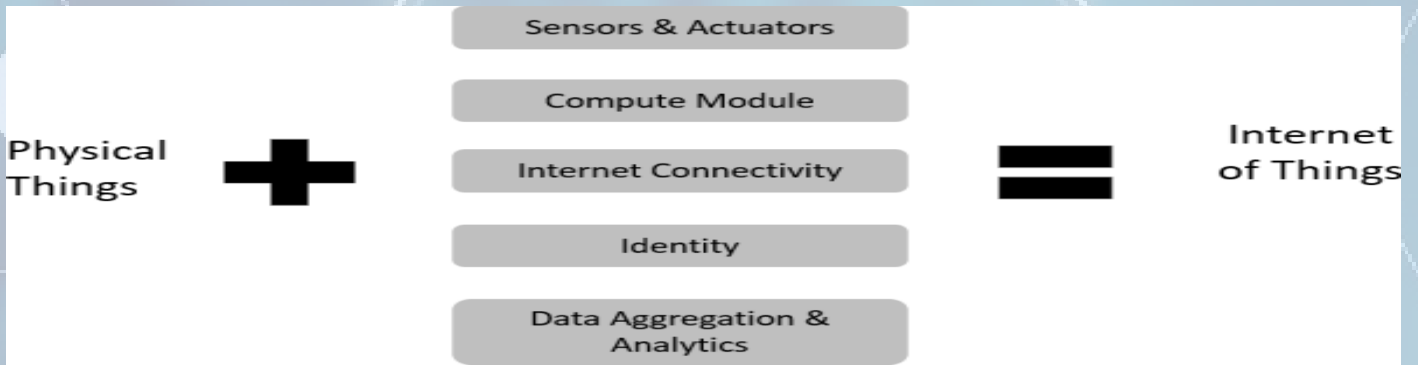
College life is a remarkable and essential time in a person's life and everyone should enjoy it. College life teaches us many things and build our confidence to face the challenges and struggle in our life. It is said that today's students are tomorrow's leader as their future and future of the country both lies in the hands of students itself. They play an important role in shaping their country in desired shape or mar its progress. Overall development and progress of the country rely on them. So, problems will come with changing new faces till the last breath, so it doesn't mean that to flee from the problems but we should face them and heed on their solutions. Remember your teachers, family, friends all are there to assist you whenever you want. Under proper guidance of their parents and teachers, students should work in the proper development of their character as a whole and work towards the development of their country.

Mr. Nand Kishore Das

A.P (Physics, BSH), BACET, Jsres knowledge.

What is Internet of Things?

The Internet of Things (IoT) describes the network of physical objects ('Things') that are embedded with sensors, computing hardware modules, software, and actuators for the purpose of sensing and exchanging data with other devices and systems over the Internet. The primary goal is to respond effectively to situations in the real world by deriving actionable insights from the data we receive from the 'Things'.

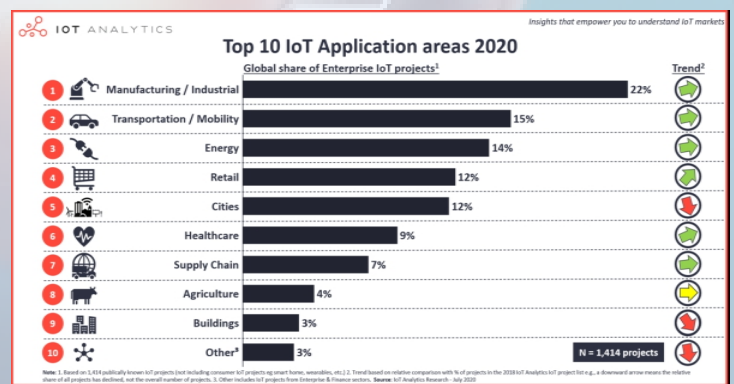


Smart cars, smart homes, smart industries and smart cities are changing the world as we speak and they are all exchanging information with one another.

Analogy – Human Intelligence Vs Machine Intelligence



IOT APPLICATION AREAS AND USE CASES



What is Internet of Things?

Use Case 1: Rolls Royce



The problem: High usage and standard wear and tear, along with a lack of a proper system to optimize the maintenance process

The solution: Rolls Royce built a highly refined monitoring system, using an IOT Suite to aggregate data from disparate sources. With predictive analytics, they were able to more accurately forecast the need for maintenance, and optimize the process accordingly.

Use Case 2: Maersk



The problem: Relatively high costs of transportation, as well as the problem of goods spoiling in transit

The solution: To optimize its processes, and increase cost efficiency, Maersk now uses a Remote Container Management system. Its fleet of 300,000 containers are monitored, and temperature reports help them intervene to reduce wastage, particularly with fresh produce.

Use Case 3: John Deere



The problem: Relatively low yield of crops, by using more traditional farming techniques

The solution: By implementing IOT sensors, wireless communication and cloud apps, John Deere is driving change in farming by boosting efficiency and helping increase per-acre crop yields.

What is Internet of Things?

Use Case 4: Connected Cows or The Internet of Cows



The problem: Theft of cows in the UK by cattle rustlers

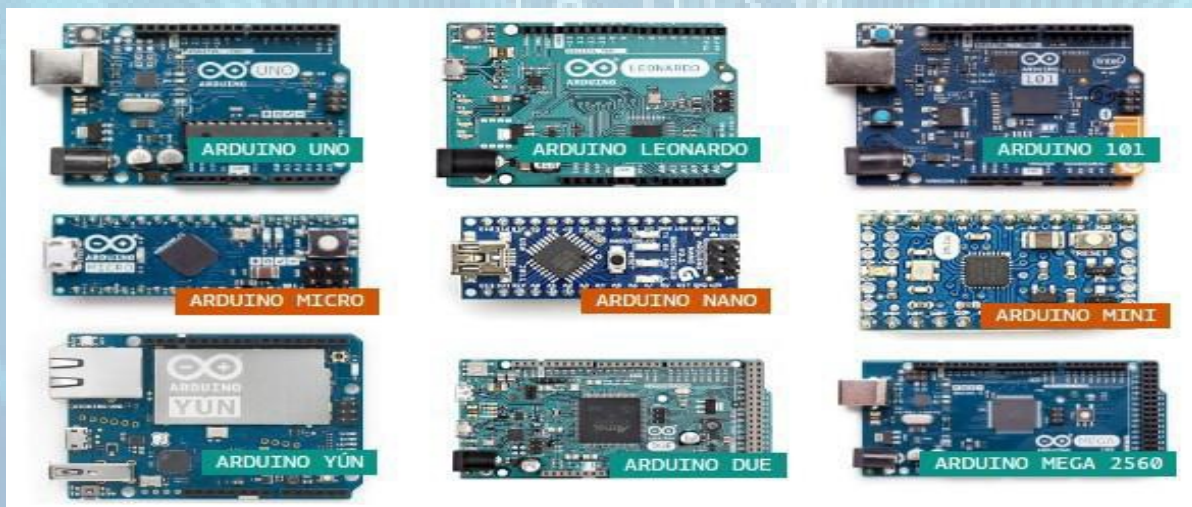
The solution: Cows were fitted with digital tags as a way to track the movements of herds, and guard against cows being stolen. A fully grown cow in the UK is worth about £2,000, and so they were worth keeping a close eye on. Even if a cow was picked up, the system could track exactly where it was being taken

ARDUINO PLATFORM

Arduino is an open-source electronics platform that includes easy-to-use hardware and software. Arduino hardware boards are able to read inputs - light on a LDR sensor, a finger-press on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

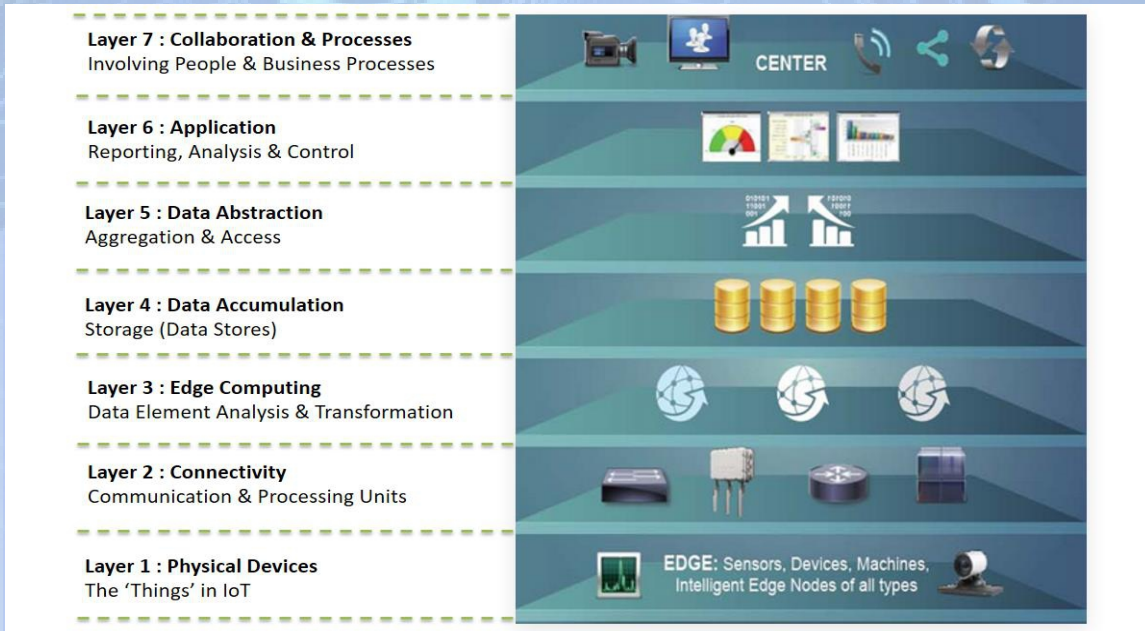
Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller board) and a software IDE (Integrated Development Environment). The Arduino IDE runs on Windows/Linux/Mac computers, and is used to write and upload computer code to the physical board. The Arduino software is easy-to-use for beginners, yet flexible enough for advanced users. The boards are programmed using a simple, designer friendly programming language called Processing, which is very similar to C language.

Arduino Boards



What is Internet of Things?

7-LAYER ARCHITECTURE



IoT is about **connecting the unconnected**, enabling smart objects to **communicate** with other objects, systems, and people. The **end result** is an **intelligent network** that allows **more control of the physical world** and the enablement of **advanced applications**.

By Amiya Ranjan
EEE 5th Semester,
2020-24.

People Are Losing Real Personalities To Grab Attention In Social Media!

Today individuals consider online networking as an idea of a progressive advancement that enables us to post photographs, tell individuals how we grope or catch up with friends. Sounds sufficiently straightforward, isn't that so? Wrong. The issue that the web-based social networking sites have given us is, that we take cover behind screens, enabling others to judge us for the lives we need them to think we have, the lives we depict on the web. It's sufficiently simple to do. There are two reasons why online networking accounts assist our capacity to communicate more virtually than we do, face to face. The principal reason, is sufficiently simple to spot. The second reason is that it's difficult for us to understand our own selves, and do an introspection of what we do daily and why we want to do it. Here's the place it gets very genuine: The more you include yourself with online networking, the more you may get a handle on the way that you have less resilience for individuals. When they start to "like" and "remark" on our photographs, we think they genuinely like what we're giving them, or they need us to help them in the same way.

The world was less demanding when we didn't need to demonstrate anything to anybody. We absolutely shouldn't these days, in any case. Web-based social networking should not be an approach to impart to your companions how you live. Perhaps it's likewise on the grounds that we need individuals to believe we're secure when in fact, we don't really need anyone to tell us our worth. On the off chance that others can take a gander at our photographs decidedly and think we have extraordinary lives, at that point perhaps we can as well. We don't need our companions to believe we're forlorn, so we post photographs and statuses that show how much fun we can have. We don't need anybody to know we eat a considerable measure, so we post photographs of educated plates of mixed greens. Online networking skews our impression of reality. Being eye to eye with somebody is all of a sudden, a change from seeing him or her through a screen. It's extraordinary, and we're confronted with the stun of good antiquated correspondence.

To a ton of web-based social networking clients, it's simpler to be pleasing and sweet through an application. A large portion of people don't have extraordinary lives. So why say something else on the web?

-BY RIVAS KUMAR ROY
B.TECH, CSE, 3RD SEM

Our Changing Society

Society is the place we live in , all the people we have to deal with. It can be a small group or a large one. It's terrible to think that just 62 years ago. America was a friendly society.

As we can see ,society has change,and is still changing as our days continue. The very morals that America was built on have been lost. Another issue of today's society is technology. Yes,it has brought upon great medical and security advancements ,but it has also a new type of error. Cyberbullying is where someone terrorizes and bullies someone else online, where they can have an anonymous presence and won't get persecuted . More than one in every teens have been bullied online . Society is changing rapidly, and it's sometimes difficult to keep up with it .We need to ask ourselves, is it changing For the better? I say now. There are indeed , good things that have come from our ever changing world , but with good comes bad. In olden days , kids played with their imaginations and created entire world with something as simple as a cardboard box. And now days instead of kids playing fun and creative games , they are stuck inside playing " Angry Birds " on ipods. In olden days , poople use to greet each other on the street and shake each other's hands. And in this generation , people no longer greet each other on street , but push their way through. Divorce rates have jumped from about 385,000 divorces in 1950 to over 8,203,000 divorces in 2009. In family has lost of its values. Being a past of this current generation . I have experienced that things are completely opposite in this generation. Teens are becoming more involved in drinking alcohol and smoking.

In my opinion , to enter the new life, to bring people to their senses , to provide our offspring with the happy future we must reform the society . The current generation must try to create a new society that does not emphasize and glorify . And I feel we need a restructuring of society . When the life in society goes bad , it means we must perform the change , relief . The change must be a relie

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Semester : 3 rd

Position Of India In Innovation

India , a country called as a " Golden Bird" by everyone is a country who is lacking in one of the important field , i.e , in innovation. Innovation means to have something innovative that can lead in new discoveries. Though our "golden bird" is progressive in most of the field yet it is position in innovation is very weak.

If we go internet , we will find major inventions like electricity , steam engine , television etc. are done in U.S.A and China. Though many countries are working hard for it , as a result of which , at present , Switzerland is at first position in the world for innovation and U.S.A is at fourth position while India is at 66th position in the world. Besides being a consumer , our "golden bird", India should be an inventor.

Innovation is something that cannot be learnt or taught. It can be endured within one only when a person has an ability to admire and wonder a nature.

Now a days in school , a student should develop a habit to query. One should not be bookish. A student should be an innovator so that this world can get a very good inventions. Scientist like Albert Einstein , Dr C.V. Raman and many more were very good innovator and it is due to them that we are studying many laws in science. Now it is our turn to innovate some laws that will be studied in future by our brothers and sisters. It is very necessary to discover and invent some new thing that can lead India to fly at a great height.

One important and the only message of my article is that we Indian should make our " golden bird" . India as a best innovator, producer and a discover. India have to be a leading inventor and discoverer to make it's dream come true and every Indian has a dream to make India a most powerful country in the world.

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Reputation vs Character

*Reputation is what other people think of us .
Character is knowing who you are .
Reputation is the picture.
Character is the reality.
Reputation may be camouflage.
Character is the truth .
Reputation can be damaged by others.
Character can be damaged only by oneself.
Reputation is a bonus .
Character is the achievement.
Reputation invites admiration.
Character invites trust .
Reputation is the exterior.
Character is the interior.
Reputation is the image.
Character is the substance.
Reputation may be overdraft.
Character is your balance.
Reputation is built by what you stand for .
So it will be more faithful to build
Up your character , Reputation.....will be made.*

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Revolution Neurolink: Combining Humans and Robots

With its revolutionary brain-computer interface technology, Neuralink, led by Elon Musk, ushers in a revolutionary age in neuroscience. The basic goal of Neuralink is to use tiny threads inserted by an advanced surgical robot to create a direct neural link between the human brain and computers. With continued development, this innovative technology may be able to heal neurological disorders, improve sensory function, and perhaps enhance human cognition. Neuralink imagines a time beyond the boundaries of medicine, one in which artificial intelligence and humans coexist harmoniously, opening up new avenues for learning, communication, and extraordinary exploration. But as mankind sets off on this fascinating adventure into the convergence of biological and technological advancements, ethical concerns about privacy, permission, and control loom large, emphasising the need for careful ethical and regulatory frameworks.

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SEMESTER- 7th
Session-2020-24*

Shape-Shifting Sensors

American researchers have created tiny flying robots that can monitor environmental factors.

Taking a cue from how seeds and leaves disperse through the air, a group of researchers has designed miniature flying robots that can change shape mid-air and are battery-free. Aptly named micro fliers, a swarm of these robots could easily remind you of elm and maple leaves falling through the air. But unlike the fall leaves at the end of their life cycle, the micro fliers can traverse several metres through the air and collect a variety of environmental data useful for climate studies and monitoring of agricultural farms.

The micro flier is made of Kapton, a lightweight polyimide film commonly used in flexible printed circuit boards. The electronic components are placed atop the flexible printed circuit board. Each micro flier weighs about 400 mg — lightweight enough for a small commercial drone to easily carry and deploy several of them in one go. In a light breeze, they can travel nearly 100m and can transmit data via Bluetooth for up to 60m. Additionally, they are completely solar-powered and do not require batteries to function. The work was published in Science Robotics (bit.ly/micro_fliers).

What sets apart the micro fliers from other microrobots is their ability to change shape from a folded to an unfolded state. Taking inspiration from the Japanese art of origami, the researchers came up with a design where a simple fold led to a change in the shape and consequently the falling behaviour of the micro flier.

"In its unfolded flat state, it tumbles chaotically like an elm leaf while in its folded state it has a stable descent like a maple leaf," says Kyle Johnson, a PhD candidate at the University of Washington and first author of the study. In its flat state, the airflow above the flier shifts from side to side, causing it to tip over and tumble. Conversely, in the folded, more aerodynamic configuration, the airflow remains stable and centrally aligned, enabling the micro flier to descend down a straight path.

What sets the micro fliers apart is their ability to change shape from a folded to an unfolded state.

This creates the perfect opportunity for researchers to conduct experiments where micro fliers could be dropped from drones and they start tumbling outwards in the direction of the wind. After reaching the desired height or after a pre-determined time, they can be triggered to change shape and fall down.

An electromagnetic actuator built in the micro flier facilitates the transition from an unfolded to a folded state, and a carbon fibre root structure attached on the lower side provides rigidity as it falls down. "Deploying multiple fliers at a time allows us to automatically disperse a network of sensors in the air," says Johnson. They can be used to monitor how temperature, light, humidity and other environmental factors vary.

Shivam Choudhary

5TH Semester/ ECE (2021-2025)

Session-2020-24

Technology

By Koushik Ojha (CSE 1st year)

Technology has played a significant role in the development of human society, from the invention of tools and techniques for farming and building to the creation of complex machines and systems for communication, transportation, and medical care. Technology refers to the use of scientific knowledge for practical purposes, especially in industry. It involves the creation and use of technical means and tools to help solve problems and achieve goals. Today, technology is advancing at a rapid pace, with new innovations and developments being made in fields such as Artificial intelligence (AI), 5G technology, educational technology, IT (information technology), Bio technology. These advances are helping to improve the efficiency and effectiveness of many different industries and processes, and are leading to new products and services that were previously unimaginable.

Today's most popular technology Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. AI include expert systems, natural language processing, speech recognition and machine vision. Artificial intelligence started gaining popularity a decade ago. It has still not slowed down and continues to be one of the leading technologies in 2021. AI is constantly evolving, and newer applications for this technology continue to spring upon the scene. Today's most popular AI applications are image and speech recognition, navigation programs, voice assistants like Siri and Alexa, and much more. 5G wireless technology is meant to deliver higher multi-Gbps peak data speeds, ultra low latency, more reliability, massive network capacity, increased availability, and a more uniform user experience. 5G technology has the potential to change the way we see the online world.

3G and 4G technology transformed how we interacted with mobile devices, enabling faster internet browsing, using data-driven services, and increasing bandwidth for live streaming. 5G aims to revolutionise our virtual interactions by integrating AR and VR technology and better cloud-based gaming experiences. Higher performance and improved efficiency empower new user experiences and connects new industries. Education technology, also known as edtech, refers to the use of technology to support and enhance teaching and learning. During the COVID-19 pandemic, edtech has played a significant role in helping schools and universities to continue delivering educational services while in-person instruction was not possible. Education technology refers to the use of technology to support and enhance teaching and learning. This can include a wide range of tools and resources, such as educational software, online learning platforms, virtual reality and augmented reality experiences, and more.

IT (information technology) refers to the use of computers, software, and other technological tools to manage, process, and store data, as well as to transmit and secure information. IT is used in a variety of settings, including businesses, educational institutions, and government agencies, to support a wide range of activities, such as communication, research, data management and analysis, and decision-making. IT professionals, such as computer programmers, network administrators, and cybersecurity experts, are responsible for designing, implementing, and maintaining the systems and infrastructure that enable the use of IT.

Biotechnology is the use of living organisms or their products to make or modify products or processes for specific use. It encompasses a wide range of techniques and applications, including medical and pharmaceutical research, agriculture, and environmental management. Some examples of biotechnology include the use of bacteria to produce antibiotics, the genetic modification of crops to improve their resistance to pests and diseases, and the use of enzymes to clean up oil spills. Biotechnology has the potential to revolutionize many fields and has already had a significant impact on society. Overall, technology is an essential part of modern society and has played a key role in driving human progress and development. While there are certainly challenges and concerns to be addressed, the potential benefits of technology are vast and exciting, and will continue to shape the world we live in for years to come.

Trends Of Electronics Manufacturing

The electronic manufacturing industry has seen rapid growth in recent years, driven by the increasing demand for electronic devices and the development of new technologies. As the industry continues to evolve, it is important for manufacturers to stay up-to-date on the latest trends and innovations. In this article, we will explore some of the key trends in electronic manufacturing.

Internet of Things (IoT)

The Internet of Things (IoT) refers to the network of physical devices, vehicles, and other objects that are connected to the internet and can exchange data. As the number of IoT devices continues to grow, electronic manufacturers are developing new technologies to support them. This includes the development of low-power, high-performance microcontrollers and sensors, as well as new wireless communication protocols.

Artificial Intelligence (AI)

Artificial intelligence (AI) is another trend that is having a major impact on electronic manufacturing. AI is being used to automate a variety of processes, from design to testing and quality control. This is helping to increase efficiency and reduce costs, as well as improve the accuracy and reliability of electronic devices.

Additive Manufacturing

Additive manufacturing, also known as 3D printing, is becoming increasingly popular in electronic manufacturing. This technology allows manufacturers to create complex electronic components and circuit boards with greater precision and accuracy. This can help to reduce production time and costs, while also improving the quality of electronic devices.

Robotics

Robotics is another trend that is transforming electronic manufacturing. Robots are being used for a variety of tasks, from assembly and inspection to packaging and shipping. This is helping to increase efficiency and reduce costs, as well as improve the quality of electronic devices.

Green Manufacturing

Green manufacturing is a trend that is becoming increasingly important in electronic manufacturing. As consumers become more environmentally conscious, manufacturers are developing new technologies and processes that reduce waste and minimize environmental impact. This includes the use of renewable energy sources, the recycling of electronic components, and the development of eco-friendly packaging.

Cybersecurity

Cybersecurity is a growing concern in electronic manufacturing, as the number of connected devices continues to increase. Manufacturers are developing new technologies and processes to improve the security of electronic devices, from encryption and authentication to intrusion detection and prevention.

Wearable Technology

Wearable technology is another trend that is driving innovation in electronic manufacturing. This includes smartwatches, fitness trackers, and other devices that are worn on the body.

Shivam Choudhary

ECE/5THSEM(2021-2025)



Parnassus



Symphony of life

*In the dance of time, whispers fleeting,
Friends hear the rhythm, life's greeting.
Moments pass, like pages in a book,
Embrace each step, don't fear the look.*

*Waves of change, relentless tide,
In impermanence, life does abide.
Tomorrow's haze, uncertain and wide,
Yet within each dawn, hope resides.*

*So, my friends, in the fleeting spree,
Cherish the present, let your spirits roam free.
For in the ebb and flow, the key,
Is to live, learn, and simply be.*

Submitted by:
Debraj Mahato
CSE 5th semester
CSE/05/21

2. Bits and Shadow

*In lines of code, opportunities unfold,
Tech's vast canvas, stories yet untold.
In algorithms, potential takes flight,
Innovation's glow, a beacon of light.*

*Yet in the shadows of digital might,
Lies the dark side, unseen at first sight.
Privacy wanes, as data streams flow,
A cautionary tale of what we bestow.*

*So, tech mate's, navigate with care,
Seize the future, but be aware.
In the binary realm, where choices reside,
Balance the bits, let ethics be your guide.*

Submitted by:
Debraj Mahato
CSE 5th semester
CSE/05/21

Beauty

*Beauty in someone's face,
Beauty in someone's eyes,
Humans are mortal,
The same way their beauty also dies.*

*Beauty lies everywhere. To find it,
You don't have to walk miles.
Trees, skies, sunsets, sunries,
Beauty is in being natural, forget styles.*

*Stop praising beauty of
human's face, it's ephemeral.
What matters is the beauty of
heart and mind, as it is eternal.*

Jainab Fatma
CSE 5th Semester

Live Your Own Colour

*A splash of colour,
One after the other.
Influences the soul,
Beyond control.
Some colours empower,
Some overpower.
Affect our mood,
In chaos as well as solitude.
Have a mysterious language,
with varied perspective and angles.
Intricate and prismatic,
With their kaleidoscopic magic.
Akin to our gamut of emotions,
Depicts plethora of notions.
So in a spectrum of colours,
Dare to be your favourite colour pop?
Accomplish your goals with no reason to stop?
Choose the colour of your choice?
And live a life of rejoice?*

Anumita Sengupta
Vice-Principal & HoD, Dept. Of Electronics & Communication Engg.

बीतें लम्हें

वो गरमीयों मे नंगे पाँव चलना
मीलो दूर सरोवर तक जाना
और वहाँ डुबकियाँ लगाना
मन को अतयंत खुशी दे गया
वो आनंद अब घंटो भर शावर मे रह कर भी कहाँ
वो बागो मे प्रथम पहुँचना और फिर
उस विशाल आम की वृक्ष पर चढ़ने की कोशिश करना
न चढ़ पाने पर उस आम की गिरने की प्रतिक्षा करना
मन को अतयंत खुशी दे गया
वो आनंद अब आम खरीद कर खाने मे कहाँ
पूरे हफ्ते स्कूल जाना और एतवार के दिन
पड़ोस के घर जाकर छोटे मे टीवी पर
मिलकर वो कृष्ण की सीरियल देखना
मन को अतयंत आनंद दे गया ॥
वो आनंद अब बड़े एल सी डी मे भी कहाँ॥
स्कूल पर सखियो के संग आँठ घण्टे रहना
फिर घर पहुँचकर उन्ही सखियों से
लैडलाइन पर थोड़ी सी बातें करना
मन को अत्यंत खुशी दे गया॥
वो आनंद अब घंटो फोन पर वीडियो कॉल मे कहाँ ॥
बीतें दिन कहाँ आए फिर
आज के लम्हो को भी जी लो
वरना फिर कहेंगे बीत गए वो दिन ॥

Thanks

Teena Mahato

BBA Lecturer

कागज़ और कलम

कलम ने कहा ये कागज़ से, कि तू है रूह पाक्रीज़ा,
बता तेरी रजा क्या है, क्या लिख दू आज मैं तुझपर ?
दया आती है मुझको तो, यह जो जुल्म है तूझपर ।
कभी तुम जल भी जाते हो, लपट जो आशिकों के है ।
कभी हो जाते सौ टुकड़े, यों गुस्से के समंदर में ।
कभी तुम भीग जाते हो, कि जब बादल बरसता है ।
देख कर तेरी हालत, मेरा मन भी तरसता है ..

मुस्कुरा कर कागज़ ने बस यही कहा है -

क्या मालूम है तुझको, यह गम इतना क्यों छोटा है?
कर दू वजूद को ज़िंदा, यही सौभाग्य मेरा है...

Shahla Perween

CSE, 5th Semester

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