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KLS VDIT, HALIYAL

Foundation Day

Souvenir 2022

Karnatak Law Society, Belagavi

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Shri. Anant Mandgi

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Shri. R. S. Mutalik	Member
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Dr. V. A. Kulkarni	Ex-Officio

KLS VDIT

VISION

To nurture talent and enrich society through excellence in technical education, research & innovation.

MISSION

- To augment innovative pedagogy, kindle quest for interdisciplinary learning & to enhance conceptual understanding.
- To build competence, professional ethics & develop entrepreneurial thinking.
- To strengthen industry institute partnership & explore global collaborations.
- To inculcate culture of socially responsible citizenship.
- To focus on holistic & sustainable development.

प्रल्हाद जोशी
PRALHAD JOSHI
ಪ್ರಲ್ಹಾದ ಜೋಶಿ

संसदीय कार्य, कोयला एवं खान मंत्री
भारत सरकार
नई दिल्ली
MINISTER OF PARLIAMENTARY AFFAIRS,
COAL AND MINES
GOVERNMENT OF INDIA
NEW DELHI

MESSAGE

I am glad to know that KLS Vishwanath Rao Deshpande Institute of technology of Haliyal is celebrating its Foundation Day on completion of 18 years of befitting journey of imparting technology education in preparing its students in the ideal tasks of Nation building. I am also happy to know that on this auspicious occasion a souvenir is being brought out containing useful articles of technological importance. It is also a matter of rejoice that this esteemed institute of learning is committed to developing a holistic and all-encompassing education system with its pervading effect especially in rural regions like Haliyal and surrounding areas, which has benefitted thousands of rural students.

I wish the function every success and may the commemorative souvenir come up attractively to make it worth preserving by one and all. On this occasion. I heartily congratulate the teaching and non-teaching staff and also students.

(PRALHAD JOSHI)

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Tel. No. : 0836-2251055, 2258955, E-mail : pralhadvjoshi@gmail.com

Dr. ASHWATH NARAYAN C.N
Minister for Higher Education,
IT&BT, Science and Technology,
Electronics and Skill Development,
Entrepreneurship & Livelihood and
Ramanagara District In-Charge Minister

Room No. 242-243
2nd Floor, Vikasa Soudha
Bengaluru - 560 001
Tele : 080-22258965
: 080-22034647

No. HrEdn.IT&BT.S&T.SD/M/ 881 /2021-22

Date: 27-04-2022

MESSAGE

It brings me great happiness to know that on the occasion of its Foundation Day, Karnataka Law Society's Vishwanathrao Deshpande Institute of Technology, Haliyal is publishing a souvenir.

This college's illustrious history and achievements are a source of real pride not only for its students, professors, and administration, but also for all stake holders. I hope that the students who have graduated from this prestigious institution will contribute meaningfully to the nation's development.

I am sure that the KLS VDIT will continue to distinguish itself through its academic quality and character and also sure that the article that will be published in the souvenir will be of particular importance to students, instructors, and other stakeholders who care about higher education quality, as well as character development and idealism in students.

I send my best wishes and greetings to everyone involved in the Foundation Day celebrations and the souvenir, and I wish them all the best in their future endeavors.

(Dr. ASHWATH NARAYAN C.N)

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ
("ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ 1994" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

Visvesvaraya Technological University

(State University of Government of Karnataka Established as per the VTU Act, 1994)

"Jnana Sangama", Belagavi - 590 018, Karnataka State

Dr. Karisiddappa, *B.E., M.Tech., Ph.D.*
Vice Chancellor

Phone :(0831)2405454
Fax:(0831)2405456

Ref. No.: VTU/VCS/2022-23/ 12 **Date: 28-04-2022**

MESSAGE

I am pleased to know that KLS Vishwanathrao Deshpande Institute of Technology, Haliyal, is celebrating its Foundation Day and publishing a Souvenir to commemorate its journey of achievements on this occasion.

Over the past eighteen years of its existence, the VDIT has produced thousands of graduates who are spread across the globe and have made an impact in exhibiting professional skills , which has given an identity of prominence in engineering education, to this College. I wish the College to achieve greater excellence in the years to come.

I wish all the best to the students and teaching faculty involved in bringing out the Souvenir on this occasion. My best wishes and greeting to everyone involved in the Foundation Day Celebration.

Dr. Karisiddappa 28.4.22
Vice Chancellor

To,
The Principal,
KLS Vishwanathrao Deshpande Institute of Technology, Haliyal.

ANANT MANDGI
Senior Advocate
PRESIDENT

KARNATAK LAW SOCIETY

Post Box No. 512, KLS Campus,
Tilakwadi, Belagavi - 590 006. KARNATAKA

The road from 1939 when Karnatak Law Society (KLS) was established, to 2004, when KLS' Engineering College in Haliyal, KLS VDIT, was established was marked by a quest for excellence, collaboration with experts, and untold sacrifices by members and staff. It is these virtues that made the seemingly impossible ambition of going to a rural destination, for a Belagavi centric Educational Trust, feasible.

Going to Haliyal was not an easy decision to make, and a harder one to implement. Today, in 2022, when I look back I am filled with immense pride at what KLS VDIT has already accomplished, and express heartfelt gratitude toward all those who have made this possible.

KLS celebrated its Platinum Jubilee in 2018 in the presence of the President of India, Chief Justice of India, the Chief Minister of Karnataka, the Attorney General of India, and other exalted dignitaries and well-wishers, all on stage at one time, a feat that is unmatched in the history of Belagavi.

I wish KLS VDIT and its governing council a similarly path breaking journey ahead.

Shri. Anant Mandgi
President
Karnatak Law Society
Belagavi

Tel : +91 831 2405524, 2405533 Fax : +91 831 2485353 Web : klsbelgaum.org Email : klsbelgaum@gmail.com

KARNATAK LAW SOCIETY

Registered under Society Registration Act XXI of 1860 No. 950 of 1939-1940
Registration of Bombay Public Trust Act 1950 (Bom. XXIX of 1950) No. E-107(BGM) 19th Sept. 1952
CHARITABLE INSTITUTE PAN No. AAAAT3599E

Estd. 1939

PRADEEP S. SAWKAR, Advocate
Chairman

Post Box No. 512, KLS Campus, Tilakwadi,
Belagavi - 590 006. KARNATAKA
Tel : 0831-2405524, 2405533, Fax : 0831-2485353
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MESSAGE

I am very happy to know that KLS, VDIT, Haliyal is celebrating Foundation Day on the 11th of May 2022 and on this momentous occasion, a Souvenir showcasing the progress and achievement of the Students and Faculty in Educational, Cultural, Sports and other activities is being brought out. In the year 2004, as a part of an initiative to set up a Technical Educational Institution in a Rural area, Karnatak Law Society, Belagavi, with the help and advice of our Patron and former Minister, Government of Karnataka, Sri R.V. Deshpande, established this Institution in his father's name, viz., Vishwanathrao Deshpande Rural Institute of Technology at Haliyal. Apart from the wonderful achievements brought out in the Invitation, we can also add its association through MOU with prominent Companies like Volvo, HAL, TATA Technologies, Siemens, Toyota, BSNL, Bosch, etc. IIT, Bombay has also helped the Institution in setting up e-Yantra Robotics Lab. As a part of green initiative, the Institution has also set up Solar Roof Top generating electricity for self-consumption and also an STP. Due to quality infrastructure, education, training, and placement being provided at the Institution, students from all over Karnataka and outside are eager to seek admissions. Several College buses are being run every day to cater to the needs of students travelling from Dharwad, Hubli, Belgaum, Dandeli, etc., including a Pink Bus exclusively for Girl Students. The credit for such an unprecedented growth and success goes to the untiring efforts of the Principal, Teaching and Non-teaching Staff and the Students.

I take this opportunity to wish the function a grand success and hope that Foundation Day is celebrated every year and a Souvenir is also brought out highlighting the achievements.

Date: 2nd May 2022

PRADEEP S SAWKAR

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R.V. Deshpande
MLA

ರಘುನಾಥ ಸದನ, ಹಳಿಯಾಳ 581 329 (ಉ.ಕ)
ಕೊಠಡಿ ಸಂಖ್ಯೆ 1008, 5ನೇ ಬ್ಲಾಕ್,
ಶಾಸಕರ ಭವನ, ಬೆಂಗಳೂರು 560001

Raghunath Sadan, HALIYAL -581329 (N.K)
Room No. 1008, 5th Block, Legislative Home,
BANGALORE-560 001
Email: rvdbiroffice@gmail.com

Ref. MLA/184/22-23

Date: 11-05-2022

Message

I have a great pleasure that on 11th May 2022, *Karnataka Law Society's Vishwanathrao Deshpande Institute of Technology (KLS VDIT)* has completed 18 years and celebrating Foundation Day.

The Karnataka Law Society has distinguished legacy in the field of technical and management education and has contributed immensely towards society building.

Karnataka Law Society's Vishwanathrao Deshpande Institute of Technology is also progressing in the area of Engineering and creating employment. The journey of 18 years of VDIT is very encouraging and the role played by it is worth appreciating.

I extend my hearty congratulations to the management, principal, staff and students for their relentless efforts in bringing the institute to such greater heights. I wish *Karnataka Law Society's Vishwanathrao Deshpande Institute of Technology* much more accomplishments and accolades in the years to come.

With warm personal regards

Yours sincerely

R V Deshpande

ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ
"ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ
Visvesvaraya Technological University
(State University of Government of Karnataka Established as per the VTU Act, 1994)
"Jnana Sangama" Belagavi-590018, Karnataka, India
Phone: (0831) 2498100, Fax: (0831) 2405467, Website: vtu.ac.in

Prof. A. S. Deshpande, B.E(Mech), M.Tech., Ph.D.
Registrar

Ref. No.: VTU/PS/2022-23/ 725 **Date:** 30 APR 2022

MESSAGE

It gives me a great pleasure to know that, KLS's Vishwanathrao Deshpande Institute of Technology, Haliyal is celebrating Foundation Day on 11th May 2022 to commemorate 18 years of glorious journey in providing technical education.

The Institute has carved out a niche for itself, earning a reputation by imparting quality education. Human Resource Growth is one of the most significant aspects of a country's overall development. In this context, organizations such as KLS's VDIT are performing admirably by providing high-quality educational opportunities with a focus on character development and idealism.

My best wishes to the Management, Principal, Faculty Members, Non-teaching staff, Editorial team and also the students of this college & congratulate for their efforts in bringing out this Souvenir in a very innovative manner.

Prof. A. S. Deshpande
REGISTRAR

Date : 26.04.2022

Dr. B. E. Rangaswamy Ph.D.
Registrar (Evaluation)

KLS Vishwanathrao Deshpande Institute of Technology, Haliyal known for its academic excellence over the past 18 years and offered thousands of students an opportunity to pursue their dream of attaining excellence in their professional life. It is indeed a matter of pride and joy to know that KLS Vishwanathrao Deshpande Institute of Technology, Haliyal is celebrating "FOUNDATION DAY" and Unveiling of Shri Vishwanathrao Deshpandeji bust, Inauguration of – Toyota Center of Excellence, Basket Ball Court, Seminar hall and many more events and also bringing out its souvenir as a part of celebrations.

I hope that the Magazine would provide details of the activities conducted by the institute and provides opportunity to its students, staff, alumni and industry collaboraty.

I would like to congratulate the editorial committee for their efforts in bringing out this souvenir and wish all the best to the Management Committee, Staff and Students for the Foundation Day Celebration.

(Dr. B. E. Rangaswamy)
REGISTRAR (EVALUATION)

Souvenir 2022

KARNATAK LAW SOCIETY

(Registered under Society Registration Act XXI of 1860 No. 950 of 1939-1940)
(Under the Registration of Bombay Public Trust Act 1950 (Bom. XXIX of 1950) No. E-107(BGM) 19th Sept, 1952)
(CHARITABLE INSTITUTE PAN NO. AAAAT3599E GSTIN : 29AAAAT3599E1Z5)
Post Box No, 512, KLS Campus, Tilakwadi, Belagavi - 590006 Tel: (0831) 2405524, 2405533,
E-mail: klsbelgaum@gmail.com, Web.: klsbelagavi.org

Ref. : KLS/ Date :

Namaste!

Foundation Day is an occasion for all of us to remember, acknowledge our own moment in history, and envision the future with hope and fidelity.

KLS – VDIT has come a long way, since its inception in 2004 - 05 & has made a significant impact in the field of technical education through its resourcefulness. I personally value the efforts of all the stakeholders & thank them for their contribution in the illustrious journey of KLS-VDIT.

It's said ***Education is the foundation upon which we build our future***....The world is undergoing rapid changes in the knowledge landscape. With various dramatic scientific and technological advances, such as the rise of big data, machine learning, and artificial intelligence, many unskilled jobs worldwide may be taken over by machines, while the need for a skilled workforce, particularly involving mathematics, computer science, and data science, in conjunction with multidisciplinary abilities across the sciences, social sciences, and humanities, will be increasingly in greater demand. The growing emergence of epidemics and pandemics will also call for collaborative research in infectious disease management and development of vaccines and the resultant social issues heightens the need for multidisciplinary learning.

The National Education Policy lays particular emphasis on the development of the creative potential of each individual & **at VDIT our focus is on imparting practical - interdisciplinary learning** through strong Industry, Academia & Alumni connect.

I once again express my sincere gratitude to all the stakeholders for their timely support & encouragement, which prompts us to imagine and creatively envision a future, to achieve higher milestones, as we grasp emerging new insights, possibilities and technologies necessary to ***Nurture talent & Enrich society through Excellence in technical education, Research & Innovation.***

Yours sincerely,

Vinayak Lokur
Chairman – Governing Council
KLS VDIT

Karnataka Law Society's
VISHWANATHRAO DESHPANDE
INSTITUTE OF TECHNOLOGY, HALIYAL
(Recognized Under Section 2(f) of UGC Act, 1956)
Approved by A.I.C.T.E., New Delhi, Affiliated to V.T.U., Belagavi
Udyog Vidyanagar, Dandeli Road, Haliyal - 581 329, Dist: Uttara Kannada, Karnataka
Ph : 08284-220861, 221409 Mob : 9449454542 Fax : 08284-220813 www.klsvdit.edu.in | principal@klsvdit.edu.in

KLSVDIT/

Date : 05.05.2022

MESSAGE

It is heartening to realize that KLS Vishwanathrao Deshpande Institute of Technology, Haliyal is celebrating its Foundation Day on 11th May 2022 to commemorate 18 years of satisfying and splendid service to the society by providing quality engineers to the nation; blended with the best of human values. With the best of infrastructure, experienced, dedicated and elite team of faculty members, VDIT has been imparting the best of engineering knowledge through add-on courses, skill laboratories, workshops, conferences, hands-on trainings, mini/major projects, etc. beyond VTU curriculum.KLS VDIT has nurtured the best of technocrats by training the students to think rather than just to accept the facts. There is encouraging transformation in the mindset of students towards innovation and growth. It is elevating to know that our students are relishing accomplishments in the global arena. As a head of the institute, it is a matter of pride and honor for me to be part of this institution.

I thank the academic and industrial partners who have joined hands with the institute, our proud alumni and our ever-enthusiastic students to be the motives for the prevailing triumphant tale of the institute. I also thank the teaching fraternity of VDIT for their nourishing comprehensive knowledge, skills and characters in students.

I express my deep sense of gratitude to the magnanimous Karnatak Law Society Management for extending profound support and able guidance for all the endeavors at the institute.

I acknowledge the efforts laid down by our teaching& non-teaching staff and students for making this Foundation Day Celebration-2022 to be a grand success and ever memorable one. A special thanks to the team of Souvenir Committee for bringing out this edition of the Souvenir in a befitting way.

I wish everyone being blessed for success and contentment in their lives by the God.

05-05-2022

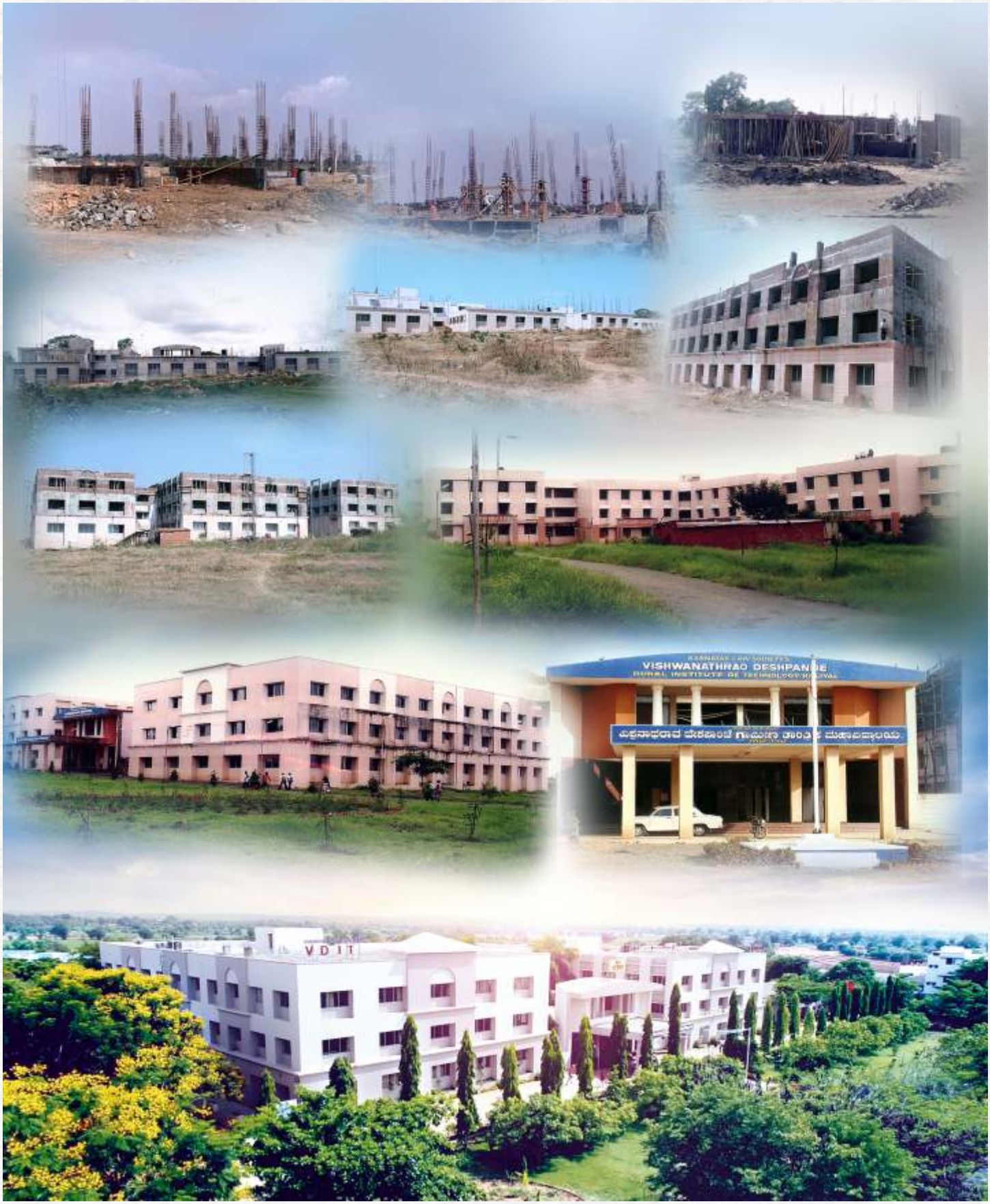
Dr V.A. KULKARNI
Principal

Contents

- Effective use of digitization : Ms. Deepti Kamalakar Mahale
- Smart construction project : Prof. Parvati Oni
- Understanding ourselves through spiritual walk : Ms. Supriya Naik
- Lead a stress free life - not by a drug - rather by the spiritual way : Mr. Vaibhav Padaki
- Influence of spirituality in our daily life : Mr. Bharatesh Benni
- ನಿವೃತ್ತಿಯ ಬದುಕು ಹೀಗೆಯೇ..... : Prof. Prasann D. Kulkarni
- Education - light of life : Ms. Poornima Korvekar
- Influence of spirituality in daily life : Mr. Guruprasad S. U.
- Implications of spirituality : Mr. Bhavraj B. Dongrekar
- Spiritual influence on education : Ms. Sampada Kulkarni
- Understanding oneness through spirituality : Ms. Bhagyalaxmi Tegur
- Stress control using spirituality : Mr. Manoj N. Mahale
- The positive impact of spirituality on humanity and health : Dr. Shrinivas A. Sirdeshpande
- Spirituality in daily life : Dr. Uttam Satpute

5. Committee Members

VDIT @ Glance



VIPs @ VDIT

Shri. R.V. Deshpande
Former Hon'ble Minister Govt. of Karnataka

Kiran Mazumdar Shaw
Chairperson & Managing Director of Biocon Bangalore

Dr. Karisiddappa
Vice Chancellor, VTU, Belagavi

Deepak Dhadoti
Managing Director, Servo Controls Aerospace India Private Limited, Belagavi

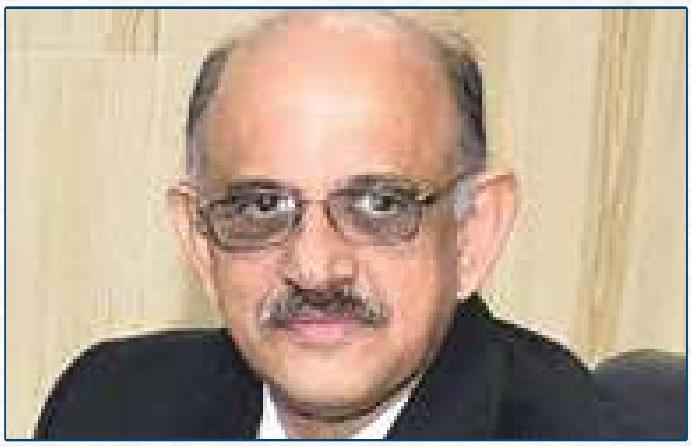
S. Gopalakrihsnan
Co-founder, Infosys Technologies, Bengaluru

Ramadas Kamath U.
Executive Vice President,
Infosys Technologies, Bengaluru

VIPs @ VDIT

Prof. H. P. Khincha
Former Vice Chancellor, VTU, Belagavi

Dr. T. M. Aminabhavi
Editor-in-Chief, Materials Science for Energy Technologies (KeAi) & Sensors International (KeAi)



Dr. J. S. Bhat
Director, IIIT, Surat

Dr. Ajith Kumar P.T.,
Scientist & President Light Logic Holography & Optics Pvt. Ltd., Thiruvananthapuram

T. V. Mohandas Pai
Former Director, Infosys

Dr. B. V. A. Rao
Professor (Retd.), IIT, Madras

VIPs @ VDIT

Gangavathi Pranesh
Stand-up comedian

Chakravarti Sulibele
Writer

Shri. Kushal Chouksey
Assistant Superintendent of Police

Vidya Ganpati Idol at VDIT

Ganesh Temple at VDIT

VDIT

About KLS VDIT

Karnatak Law Society having established a number of institutions in the city of Belagavi which have identity as Quality Educational Institutions started “Vishwanathrao Deshpande Institute of Technology(VDIT)” at Haliyal in 2004-05 by the initiation and support of Shri. R. V. Deshpande, Former Cabinet Minister, Government of Karanataka.

Within a short span of years, VDIT has developed excellent infrastructural facilities and an academic ambience to train the students to meet the challenges posed by rapidly changing techno-economic scenario. The institution has an excellent, well qualified and experienced faculty. The Institute is located on a 26 acres campus, cradled by a picturesque landscape.

VDIT Journey	
2004-05	• KLS VDIT (Formerly VDRIT) started at Haliyal with 4 branches of engineering. Computer Science & Engineering, Electronics & Communication Engineering, Electrical & Electronics Engineering, and Mechanical Engineering with an approved intake of 60 in each branch totaling to 240. • First annual day was conducted for the students on 17th June 2005. Hon'ble Cabinet Minister (GoK), Shri. R.V Deshpande was the Guest of Honour.
2006-07	• SUVARNA KARNATAKA UTSAV was celebrated on 5th December 2006. Well known Kannada writer Shri H. Dundiraj delivered lecture on "Chutuku Sahitya".
2007-08	• AAVISHKAR- An annual techno-cultural fest was started. • KAPLPAVRAKSHA, a Kannada forum was inaugurated on 22nd November, 2008.
2010-11	• Introduction of CIVIL ENGINEERING Course with an intake of 60 students. • Department of Chemistry was recognized as Research Centre by VTU, Belagavi. • An international conference: Recent Trends in Mechanical Engineering (RAME) was organized.
2011-12	• Department of Mathematics and Department of Electronics & Communication Engineering were recognized as Research Centers by VTU, Belagavi. • M.Tech. Course in Industrial Electronics, with an intake of 18 was started under the Department of Electronics & Communication, affiliated to VTU, Belagavi. • Inauguration of Library Building: "Jnana Sudha" and Digital Library by Shri Gopal Krishna, Executive Co-chairman, and Shri Ramdas Kamat, Associate Vice President, Infosys Technologies Ltd, Bengaluru on 2nd June, 2012.
2012-13	• An increase in intake from 60 to 120 in UG Mechanical Engineering and Electronics & Communication Engineering was approved by AICTE, New Delhi. • M.Tech. Course in Thermal Power Engineering, with an intake of 18 was started under the Department of Mechanical Engineering, affiliated to VTU, Belagavi.
2013-14	• Secured 10th position among 180 participated colleges in "DAVANA-14" Annual VTU Youth Festival organized by Bapuji Institute of Engineering & Technology, Davangere, from 26th February to 1st March 2014. Mr. Abhishek Kalgutkar won gold medal in "On the spot painting" and silver medal in "Poster making".
2014-15	• Department of Mechanical Engineering was recognized as Research Centers by VTU, Belagavi. • Department of Civil Engineering conducted "Traffic and Transportation Surveys for Preparation of Comprehensive Mobility Plan for Dandeli" organized by DULT (Directorate of Urban Land Transport), Govt. of Karnataka from 16th to 20th April 2015. • Rewarded cash prize of Rs.1,00,000/- by VTU, Belagavi for achievement in Sports and Cultural Activities. • Organized VTU Single Zone Wrestling, Judo, Gymnastic and Mallakhamba Competition for Men & Women. • VTU Single Zone Wrestling Champion (Men).

2015-16	• Workshop on Android, Web-design, Python, Cloud Computing and IOT was conducted by the Department of Computer Science and Engineering. • Organized VTU Single Zone Wrestling, Judo, Gymnastic, Mallakhamba and Taekwondo Competition. • Seven VTU Blues in Wrestling, Hockey and Netball.
2016-17	• Mechanical Engineering Department is funded by Karnataka Council for Technical Upgradation (KCTU), a joint venture of GoI & GoK for Welding Research Centre worth Rs.45.55 Lakhs. • Organized VTU Belagavi Zone Throw ball (Women) Tournament. • Two VTU Blues in Wrestling and Netball.
2017-18	• Mr. Ramanagouda Patil secured 3rd Rank in B.E. (Mechanical Engg.) to VTU, Belagavi. • Two Days All India Seminar on "Recent Trends in Highway Planning and Pavement Design" was organized by the Department of Civil Engineering in Association with IEI, Dharwad Chapter on 23rd & 24th February 2018. • One day workshop on "Demonstration and application of RASPBERRY PI" was organized on 25th October 2017 by the Department of Electronics & Communication Engineering. • Three VTU Blues in Gymnastics, Kho-kho and Netball.
2018-19	• VDIdeathon - A 24 hours State-Level Hackathon was organized on 13th October 2018 by the Department of Computer Science Engineering. • Two Days National Seminar on "Role of Enterprise Portfolio Project Management in Civil Engineering" was organized by the Department of Civil Engineering on 21st & 22nd February 2019. • Organized VTU Belagavi Zone Kho-kho (Men) Tournament.
2019-20	• Ashwini Lele secured First Rank & Gold Medal in M.Tech. (Industrial Electronics) to VTU, Belagavi. • E-yantra Robotics Lab - A Project under the National Mission on Education through ICT Program by MHRD with technical support from IIT Bombay, Mumbai was inaugurated in January 2019. • Volvo Cut Section Engine (MDE-5) was erected for the demonstration purpose donated by Volvo Group India Pvt. Ltd. on 29th January 2019. • Organized one-week National Level Online Development Program for faculty members on Moodle-Learning Management System (LMS) in association with IIT Bombay-Spoken Tutorial (IITB-ST) from 4th to 8th May 2020 with whopping 2150+ participants from all over India.
2020-21	• Projects worth Rs.13.85 Lakhs were funded by New Age Incubation Network, Govt of Karnataka for projects undertaken by students guided by faculty.
2021-22	• Organized 1st International Conference on Emerging Scientific Applications in the field of Engineering and Technology on 23rd & 24th September 2021. • Organized VTU Belagavi Zone Kabaddi (Men) Tournament (December 2021). • Organized VTU Single Zone Wrestling and Judo for Men & Women (December 2021). • VTU Single Zone Wrestling Champion (Men), Runner in VTU Single Zone Wrestling Champion (Women) and Winner in VTU Belagavi Zone Volleyball Tournament (Men).

Electric vehicles

Mr. Suraj S. D.
Co-Founder & CEO-Decibels
Lab Pvt. Ltd. Bengaluru

Electric vehicles have been identified as being a key technology in reducing future emissions and energy consumption in the mobility sector. In India most of the OEM's rely on components or subunits from China or other countries majorly for electronics. This will increase the dependency and drive the future scenario as same as crude oil/direct fuel is being imported. And due to the lack of the right suppliers, startups are struggling to introduce reliable products into the market. But on condition government of India made many initiatives to increase the use of EV in Indian Roads. India's commitment to the EV30@30 initiative - to reach a 30 percent sales share for EVs by 2030 - presents a cumulative investment opportunity of as large as INR 19.7 lakh crore . There has been a recent increase in public budgetary allocations and corporate investment in EVs in order to achieve this.

Central and state governments have approved fiscal incentives for EVs, charging infrastructure, and manufacturing that are helping achieve parity in total cost of ownership with internal combustion engine (ICE) vehicles for several segments and use cases. Original equipment manufacturers (OEMs) and component manufacturers are investing in indigenous manufacturing and supply chains. EV startups are attracting significant venture funding due to their product and business model innovation, capturing as well as creating the market opportunity presented by EVs. By all this factor defiantly there is great demand for students have specialization in EV. Many reputed college and Autonomous institutes slowly adopting EV Technologies 'in Academics. Many automotive R&D looking for talent pool of EV students.

Materials of this century

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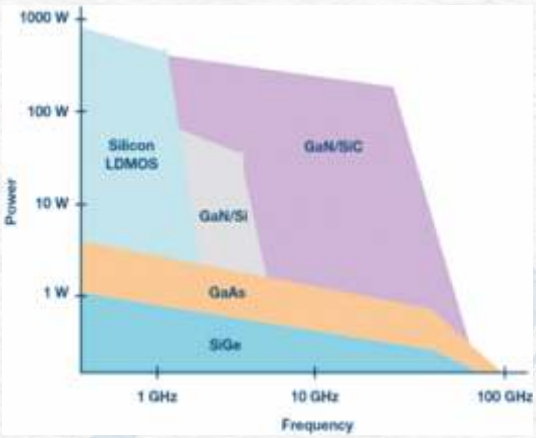
It is believed that the next AI driven decades will optimise some of the existing products and systems with its data driven capabilities with machine learning. On the human frontier we will see a wave of new emerging tech in medical and/or bio science. That leaves us hardware engineers to work in a difficult yet challenging environment of development of different types of work. Some of the major upcoming shifts in technology that are around the corner are related to material advancement in chip manufacturing, industry 4.0, improved batteries and alternate power sources. We will look at one such example here.

Silicon is age old material now in device and IC development. The work on GaN is already two decades old. From 1990s blue LEDs now in recent advancement , engineers have started using it up in the value chain. Transistors and Power ICs made from Gallium nitride are now making a dent on silicon's monopoly over IC fabrication. Gallium nitride is more efficient, more thermally stable, and certainly more capable for use in power devices that demand more load or higher frequencies at higher temperatures. Gallium nitride is a future-proofed material for the semiconductor world and will lead to more readily available small, high-frequency products. Thermal issues are endemic to power amplifiers and RF front-ends due to the huge difference between peak and minimum power requirements, and GaN is particularly good for this.



Due to manufacturing defects the wider adaptation is in question as of now. This leads to new companies and newer devices entering the market in coming years. This needs new PCB designs, newer manufacturing setups. Such other two contenders are Indium phosphide(InP) and Gallium arsenide(GaAs).

ICs, batteries, alternate power sources will be driven by advancement in material science and applications of such in new systems and products. Whether it is pick and place robots, lighting automation, or 5G networks, electric vehicles. Miniature IC in bio engineering will drive a new surge of wearables and bio implants.

The 'Industry 4.0' is incomplete without such advancements due to power hungry and economics driven models of manufacturing setups.

The Second material trend that drives the mechanical industry is with plastics. The plastic is disappearing from lower value applications and will maintain strongly in high value applications. Todays planes, trains and automobiles are made of 60% of plastics. The trend will continue and may not reverse. The need to recycle and better recycling trends will emerge rather than replacing the plastics.

Like glass, which is 100% recyclable endlessly without any loss in purity or quality. Although glass recycling was known from 70AD the industrial level recycling is not old, from 1960s the trend is more common.

The plastic recycling will be a trend of the coming decades. Compostable plastic like poly lactic acid (PLA) have now found their place in every companies books. Does it mean plastic made from biomass, like maize or starch, with characteristics that are the same as those of oil-based plastics? Such comparisons and possible challenges may shape the century.

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Recent trends in civil engineering

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Science is knowledge (Scientific knowledge) about the natural world that is based on facts learned through experiments and observations, whereas technology is the application of this scientific knowledge for practical purposes. Scientific knowledge is used to develop technology, and then this technology is used to develop science; hence these two terms are highly interdependent. Currently, the world is dealing with so many new and hottest trends in science and technology like Information and Communication Technology (ICT), BIO, Health and life sciences, and Environment, energy and climate change.

Environment, energy, and changing climate-related knowledge (science) and improvements / developments (technologies) are essential and its the responsibility of Civil Engineers. The topics related to the environment and global environmental changes are discussed in this article. Firstly, one has to look into two questions: Why are humans degrading the environment with technological development? And again, why there is a need to have or to develop technologies to cope with or understand these environmental changes?

It is a known fact that to fulfil the basic needs of human life; there is a need for technologies. But to satisfy the luxurious wants and greedy nature of humans resulted in overexploitation of the natural resources, resulting in environmental pollution. For this, one has to be so clear that whatever the changes are made in the environment again, those changes would have a bad impact in the form of form disasters. So, to avoid these, humans need to have some capabilities, which, again, is a matter of improving and advancing in the field of science and technology. The use of scientific knowledge to build some technologies against the specifics of environmental disasters/hazards is the need of the hour.

Recently, remote sensing and geographical information system (RS and GIS) technology has gained popularity in understanding the changing environment. The technology can be used to predict the various environmental processes. However, all these new technologies require the basic knowledge of the components of the environment, the structure and composition of the environment and reasons behind the climate change. RS & GIS technology would help visualise and analyse the climate data (Meteorological data), which is then used to interpret or predict (forecasting) changing climate.

Recent trends in construction technology

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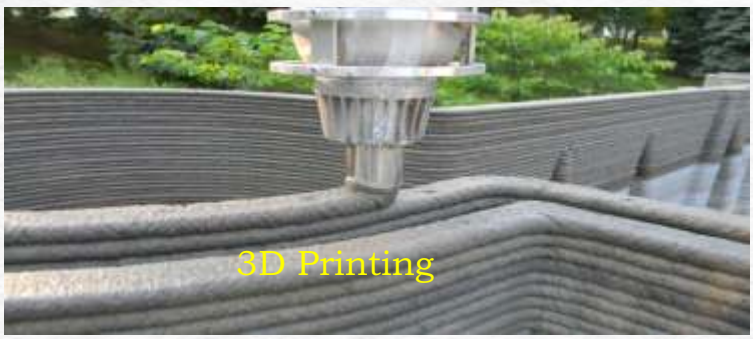
Technology has seen a significant transition towards technology over decades because of the advancement in science & technology which is the propulsion behind the changes in this business. A number of the most recent technologies here were once dubbed in sci-fi and have already begun finding their way into the thought business. Over the last decade, the main target remained smart materials and energy-efficient buildings. But, in recent times, civil engineers square measured putting additional stress on computer vision, BIM, virtual reality, sustainability, innovative materials, IoT, Drones, and 3D printing technologies that square measure parallelly gaining prominence. This test provides a mash-up of the most recent developments in technology that have become the most recent trends.

3D Printing in technology is employed to form construction parts or to print complete buildings. 3D printing is the construction of 3D objects from a CAD or digital 3D model. 3D printing is the computer-controlled

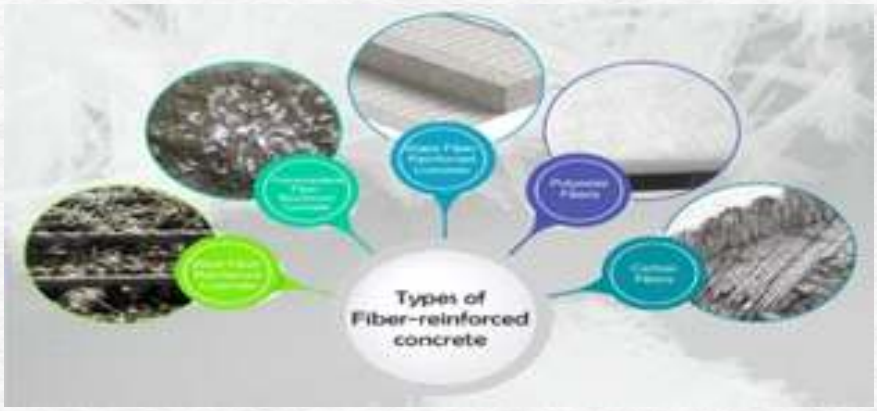


3D Printing

sequential layering of materials to create three-dimensional shapes. A number of benefits of 3D printing are embraced. Quicker construction, Lower labour & material cost, potency to form complicated structures with accuracy, Lesser waste.

Fibre Reinforced Concrete is stuff consisting of fibrous material that would increase its structural integrity. It includes mixtures of cement mortar with appropriate fibres. FRC is providing an alternative resolution to the employment of standard reinforcing steel. The kind and dose of those fibres rely upon the structural demand. Some benefits of FRC square measure providing high enduringness and reduced cracking, up the impact strength of concrete, limiting the crack growth, Improved cohesion, up pumpability over long distances, Increase resistance to plastic shrinkage throughout, minimizing steel reinforcement necessities, controlling the crack widths tightly, therefore up durability, Reduces segregation and bleed-water & will increases fatigue strength.

BIM technology, associated with the virtual nursing model of a building, is digitally created. An accurate virtual model of a building referred to as a building data model, is digitally created with BIM technology. The BIM model may be used for the planning, design, construction, and operation of the facility. The BIM model contains



precise, pure geometry and relevant information needed to understand the building. Once completed, this model can be used for operations and maintenance functions. Engineers would produce virtual models of their designs through associates in the nursing intelligent 3D modelling process. This art movement technology will speed up the time taken to show building drawings into reality. As BIM and 3D modelling offer engineers an opportunity to examine completed designs at the onset, the design process is poised to be cost-efficient and additional efficient in the future.

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Sentiment analysis

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In any product, project, or policy, understanding what the user thinks about it is very important. Only when we know the user perception, we can make better arrangements for the public or the user. All the companies which sell their products, either in the form of service or material, conduct sentiment analysis to understand the weak points and strengths of the product. Therefore, Sentiment analysis is a computational study which is used to understand the public/ user perception, sentiments and opinion. Sentiment can be positive, negative or neutral.

As the generation is moving towards digitisation, people express their genuine opinion or sentiment on online platforms like Twitter, YouTube, Facebook, Instagram, etc. Hence it is vital to analyse public opinion through online platforms. Sentiment analysis is contextual mining of text that identifies and extracts subjective data in the source material and helps a professional understand the social sentiment of their brand, product, or service. The main objective is to understand the emotions and sentiments of people on a particular topic.

The methodology of sentiment analysis is that, initially, data is collected. This data can be Twitter data, YouTube data, Facebook data, Instagram data, or other social media data, and it can be a tweet, comment, caption, sentence, or the entire document. Once the data is collected, perform sentiment analysis on the data. Data can be collected using hashtags, any online platform like Kaggle will provide the database, or one can also write a program to extract the statements from the social media.

There are many online tools to perform the sentiment analysis or one can even write the program in python to perform sentiment analysis or can even use excel inbuilt function to perform the analysis. The sentiment analysis result is a score, which is called the sentiment score or the polarity score, based on which the statement is categorised as either positive, negative or neutral. If the score is more than 0 and near 1, then it means that the statement is positive; if it is 0, it's a neutral statement, and if it is less than 0 and near -1, then it's a negative statement.

One of the studies where sentiment analysis was conducted is an analysis done by Singh P et al., in which they have performed sentiment analysis of demonetisation of 500- and 1000-rupee banknotes by the Indian government. For the study, they have used tweets from Twitter to perform the analysis. It was found that initially, the public would have some negative opinion on any policy introduced by the government, but later the majority of the public was happy about the decision taken by the Indian government.

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Software companies - the good, better and the best parts

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Safe Harbor

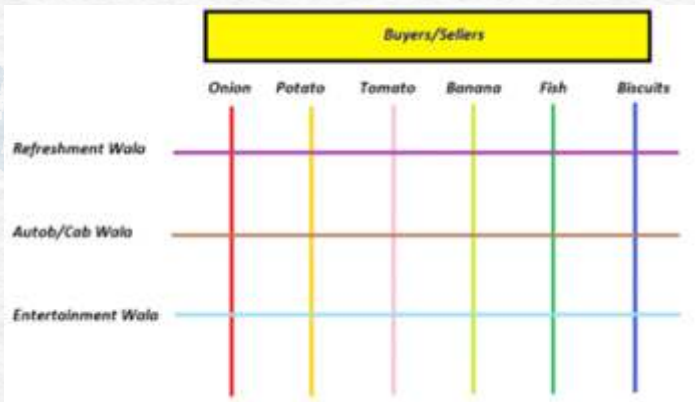
Please note, any thoughts, or any facts expressed here are based on my experiences only. This is my humble attempt, to let a student know about software companies. This article briefs (yes it's just scratching the layer) about what is the companies' structure, what is their usual business, what they expect from students/freshers and what students can expect from companies. Kindly excuse me if you feel some details are wrong or misleading. Any corrections or suggestions, about this article, is whole-heartedly welcome, along with a cup of Tea too.

Introduction

As students, who are very eager to start their professional journey, this article will be helpful in introducing, what software companies are, what is their business, how do they structure themselves, where do they see profit, and as students/freshers, how can you contribute to their business and profits. Also, the profits are two-ways, as the student too gets more of it, both inform of knowledge and monetary benefits.

Horizontals and Verticals in a software company

In my place, Sunday is a market day. The major work of people, on a Sunday morning, is to buy fresh vegetables/fish (trying to keep the balance between Veg and Non-veg readers here). Visualizing the market, its full of people, and usually, the Sun too is happily selling the sunlight, for free, obviously. With sellers/buyers bargaining, the heat is much hotter now, and that calls for some refreshments to cool the environment. The difference is some prefer Cold Juices, fruits and even some prefer hot Tea, like me. Hotels are the best place for refreshments, or most of the times, we have mobile hotels on Cycles or the Chai/Fruit/Juice-walas. Finally, after heavy buying/bargaining, we are going home now, and my home is a 4km walk, from the market. The Sun is still smiling on my head, and I can't dare to stare him. What else, look for an auto-wala, or nowadays Uber/Ola-wala. Hurray, I am in an auto/cab now, and just plugged in my earphones, so that, the YouTube/Spotify/Netflix-wala can entertain my 4km journey. The whole scenario above, can be re-imagined as the below graph.



From the above graph we clearly understand, whenever the onion seller, or the potato / tomato or any sellers get tired, and need refreshment, the Refreshment wala serves all of them. It's the same for the buyers too, when they are tired to walk, no matter the buyer bought only onion, or both potato and fish, Auto walas serve everyone. So, the sellers continue to sell their own items, and do not interfere in other seller's business. Whereas the refreshment people, will serve all these above vegetable sellers. Thus, the refreshment/cab/entertainment people's business is aligned Horizontally whereas, the sellers of vegetables/fish/biscuits, have their business laid out Vertically. This arrangement of businesses is followed in Software companies too. Businesses like Banking, Finance, Insurance, Telecom are considered Verticals. Each of these verticals need software to execute their business functions. Thus, software developers serve or develop software across all these verticals. Thus, software development, just an example, are termed to be Horizontal businesses.

The Two Types of Software Companies

Do you have a fan in your home? Obviously yes, we have them, but to buy a new fan, do you directly walk into the Bajaj or Crompton factory? Obviously no because we are not allowed to enter the factory and can get scolded too, instead of getting a fan. Ok, nothing serious here, but it's a fact. To buy a fan, we walk into a store which sells fan, and not into a factory which manufactures it. Ok, after few years/months of buying, what if the Fan is not working, and needs to be repaired, and yes, it's still under warranty period. Then, still, we cannot call or walk into the factory again, because factory is busy manufacturing them, and cannot service/repair them.

Again, we walk into the same store where we bought it or call the store, and first thing we do, is scold the storekeeper nicely. Then, like everyday business, the storekeeper says, our person will come to your home to repair, or if the storekeeper is busy too much in selling, will ask you to carry the fan till his store. Ultimately, it's the storekeeper's responsibility to repair the fan they sell, and surprisingly, they also repair the fans sold by other shops too. This is just to keep their name and increase their profits.

In the same way, software companies too, start their business. They decide, either they manufacture their own software products, or sell and service other's products, or do both, manufacture as well as service software products. We can thus categorize software companies into 2 types, Product and Service companies. Microsoft, Google, Amazon, Oracle are examples of product companies, and Infosys, TCS, Wipro are Service Companies.

JavaScript/TypeScript/WebAssembly and the Student's resume

If you know English, you can easily talk and do any kind of business, in America. Why? Because people of America understand English fast. What if you go to Spain? You need a translator, like Google Translator, and then convert your words/sentences in Spanish and then convey it to the other person, and then you know whether your proposal was accepted or rejected. This is same with Computers too. If you can write Assembly Language Code, which is directly understood by the Processor, the processor is your friend, else if you can write in Java/JavaScript on any non-Assembly languages, Processor is your distant friend.

If a fan cannot spin faster, and thus cannot provide good breezes of air, it's not sellable, also, its not buyable. Same with software too, its should be exceptionally fast and accurate. JavaScript is one such language, which runs fast. Why? Because it runs inside our browsers, and uses the CPU power. Not getting into much technical details about JavaScript, but the fact is, majority of software products run inside a browser, like Facebook, Insta, LinkedIn, etc. Browser understands only Javascript (JS), and thus companies are looking for better JS developers.

But, JS now has a competitor, and its name is WebAssembly (WA). As the name itself tells, its Assembly language, but running on Web, or Web Browser. Why Assembly language? Because our computer's Processor understands Assembly language, and thus, we should be speaking native CPU language for faster executions.

Again, can JS be combined with WebAssembly? Probably Yes, can be Googled for it, but yes, TypeScript comes to the rescue. What is TypeScript? It's a superset or father of JS. Again, we can google and learn TypeScript (TS).

Can this combination of JS/TS/WebAssembly help build even faster applications? Yes. We can build desktop applications. Why Desktop and why not Browse? Browser is limited with access to OS level resources. Desktop application has access to all OS features.

Again, not much technical, but whats the point of this?

Students, freshers, if they have in their resume that they know JS and TS and Node JS and WebAssembly, BINGO, they get a job in Product Company or Service Company which will pay more.

FAANG

FAANG stands for Facebook, Apple, Amazon, Netflix, Google

Wow, the above image looks so colorful, but this is simply a picture that a student can take a printout, stick it on his/her bedroom wall, and see it daily when they get up. Why not ha? We students, most of the time, the only thing we lack is motivation, and this picture provides it. So, I kindly, very kindly, request, please take a printout, a color printout, and stick it. Ok, what's the motivation here, looking at this picture? Just imagine yourself working as an employee in one of these companies, just imagine the knowledge you gain, the weightage in your profile/resume/linkedIn profile, the proudness in the face of your parents, and thus the matchmakers(www.shaadi.com for example) who are very eager to find you a better match. So, how can you get a job here, in FAANG Companies? Answer is in the next section.

Knowledge, the only Survival

Why? Because when attending an interview, the interviewer does not ask about how many years of experience you have. In software companies, jobs are always associated with certain technologies. Thus, the interviewer is interested in knowing what you know, and how good you know about the technology. That's it. If we are knowledgeable enough, we clear not just one, but many interviews. My friends had cleared many interviews, and they had the freedom to choose the company which is good for working and in salary.

Product companies pay more. Why? Because companies working on product development, are always in a competition. They want customers to buy their products and not their other competitor's. Thus, the product should be good in all angles, and for that, the developers who develop the product, should be good too, in all angles. And what are those angles for a student, we see in the next section. Ultimately, it means, the more better a student is in their knowledge, in engineering subjects, it's a fact that, knowledgeable people get paid high. So, product companies are always looking for such, knowledgeable students.

This does not mean Service companies pay less. The very much true fact is, most of the times, you get a chance to travel abroad, being in a Service based company as compared to a Product company. Taking our example of fan seller, the seller can ask his/her employees to advertise or assemble or repair the fans by visiting to a customer's home and the home can be 50kms away or even in a different state. In service-based software industry too, an employee may be asked to travel to America or Canada or anywhere in the world. Service companies too have a competition in providing better/best services, than their competitors. Thus, when their customer is facing any problems, in a software which was sold by this service company, they company will send their employees to that place, 50kms away or can be in a different country too and will ensure better services to their customers.

Which subject gets which job
Straight to the point, bulls' eye

Subject Name	Companies
C/C++/Java/Python Backend is something like a Kitchen in a hotel, and if the kitchen can make good, tasty eatables, then profits for the Hotel is more. Similarly, many companies are in business of manufacturing backend software, which we can also call as Middleware, the one that come in middle/between Database layer and the Browser/View layer. These are the languages which help in building strong backend systems. The backend systems can be used in communications industries for writing protocols for example, and also companies working on Servers, like Oracle's Web Logic	· Document storage company like EMC2 · Telecom company like Cisco · Computer Network companies like Aruba, Nokia, Huawei etc. · Electronics/Medical systems Company like Philips, Qualcomm, Siemens and many more · Companies who build their own server, for example Web logic is built and maintained by Oracle. So, they look for candidates good in Java
Data structures, Design and Analysis of Algorithms, Formal Languages and Automata Theory Companies, like cloud providers/ ecommerce giants, deal with complex calculations, and these calculations happen on huge data. Thus, a highly efficient way is needed to execute things, in a quicker way, and with lot of precision in the results. The above subjects are mainly helping students to get this kind of jobs. With Data Structures we say how to arrange the data, and Algorithms on how to deal with the data to finally solve the given problem	· Almost, all product-based companies, and also service based companies who are trying for similar businesses · Majorly all FAANG companies · Companies, like Oracle/Microsoft/SAP, that build ERP products · Banks who build their own software for their banking needs,like JP Morgan, Goldman Sachs etc. · E-Commerce giants like Flipkart, eBay, Amazon, who deal with large data · PayTM, for handling payment · Cab-hire companies like Ola, Uber · Cloud kitchen companies like Zomato, Swiggy (for their software divisions) · Twitter, again handling huge data
Software Engineering, Operating Systems, Database Management Systems As important the Data structures are to arrange the data, and Algos are for dealing with that data, Code Architecture too is important. Customers have their old systems, where data is stored, and now they may need a new way of handling that data. This means, the customers want to keep their old servers, but change the code that interacts with the data. Here, as students or developers, have to think on how code is written or what is chosen to write the code, that can deal with such huge data. These subjects will provide a basic understanding on how to decide a better infrastructure of the code. For example, will it be Agile based development approach, or will it be a Waterfall model to maintain the development activities or also will it be a modular or distributed, micro services approach to structure the code, like that.	· Companies like Oracle, Salesforce, SAP, Microsoft, building ERP Products Companies, like Flipkart, Amazon handling huge traffic, like traffic caused by Shopping offers released on festivals. The load will be so huge, that servers need to be added, databases need to be added, CPUs need to be added, and all should happen dynamically, without human intervention

The impact of digital transformation in smart manufacturing systems - cognitive robotics

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The volume of data will grow, as more factories utilize the IoT. IoT will be one of the principal drivers of digital transformation for years to come. The total number of IoT devices is projected to hit more than 15 billion by 2023. With this upsurge of growth, conversations around how to benefit from these devices and the data they create to better our businesses and our lives will be essential. Because of the large volume of data being disseminated, conventional computing will have a hard time keeping up. Computing must now become cognitive to manage, evaluate, and improve on the information.

The development of smart robots using machine learning techniques will remain a leading area of attention for cognitive factories. The global industrial robotics market is expected to reach $70 billion by 2023. Smart robots are already equipped with an arrangement of sensors and fundamental technology that makes them easy to program. As these robots get smarter, they'll be more responsive and autonomous. They will help manufacturers meet production objectives by being more reactive to market changes, and customer preferences. These proficiencies will make smart robots highly advantageous in settings usually retained by industrial robots. In the near future, the durability, low cost and intelligence of smart robots will lead to extensive adoption of the technology in smaller factories.

Intelligent assets and equipment will be needed to utilize connected sensors and analytics. Furthermore, cognitive capabilities will be needed to recognize, communicate, and self-diagnose problems in order to improve performance and cut down on unnecessary downtime. Smarter resources and optimization will be needed for various forms of data from workers, various locations, and equipment usage with cognitive understanding to improve resources such as workforce and energy.

Manufacturers must tackle the challenge of maintaining anticipated rates of production, especially when it comes to creating projected levels of cooperation across manufacturing operations. Using deep search and detection, cognitive maintenance can expose critical patterns that can improve prognostic maintenance, preventing unplanned downtime.

Cognitive computing is another portion of the digital transformation that the manufacturing industry is embarking on. There are many different technology trends that are on the rise and every one of these can be applied in part or whole. Adopting new technologies can be something that can be done in phases and cognitive computing fits right into that form. In the 1900s, we went from computers that could formulate sums to programmable systems in the 1950s, and now to cognitive systems. Utilizing self-learning algorithms that use data mining, pattern identification and managing language, the computer can simulate the way the human brain works.

Cognitive language technologies consist of a set of statistical techniques that allow the analysis, understanding, and production of human languages to expedite interfacing with machines, using written and verbal situations. Cognitive machine learning automates diagnostics using algorithms that learn from data without the need for precise programming. Cognitive computer vision automatically mines, evaluates, and

comprehends useful information from a single or sequence of images better than human vision. Some manufacturers ask if there is a difference between artificial intelligence and cognitive computing. Artificial intelligence tells a manufacturer which course of action to take based on its analysis. A cognitive computer provides information to help the manufacturer decide on a course of action.

Cognitive approaches can also help with flexible automation for manufacturers confronted with configuring machines quickly to increase flexibility. Shortages can be prevented using cognitive parts management with supplier details, weather, and transportation information. This information keeps lines up and running and fosters business responsiveness.

With a sensor added to a piece of machinery that monitors sound vibrations from a rotating shaft, it can automatically alert operators should the sound vibrations suddenly oscillate outside of what the cognitive computing system has determined to be the normal state. This would prevent a machine from being destroyed should a part fail. The machine can schedule its own service call or turn itself off before a devastating failure occurs. A cognitive computing system can draw parallels between process variables such as solder temperature and production levels of a manufacturing run. Extensive numbers of process and control system variables can be evaluated against manufacturing performance.

Manufacturers can use cognitive manufacturing technologies to meticulously monitor and understand the many operational attributes that impact product quality to guarantee that all products shipped to market meet their companies' quality requirements. Providing employees with sensors that help ensure their safety is a persuasive purpose for cognitive technologies. Wearable sensors constantly monitor the employee's health and endurance as well as their exposure to environmental or physical hazards. Cognitive technologies integrate data from the sensors and other pertinent environmental sources to immediately identify difficult situations that might affect an employees' health. The technology alerts the worker or supervisor of any problems that need a fast reaction. Cognitive technologies have already brought amazing things to multiple departments in manufacturing.

Visual cognitive inspection eliminates defective parts and devices before they ship to the marketplace. It assesses key defect types during in-line processes and communicates with the systems that process and catalogs them. It also quickly reconfigures production lines. When a piece of machinery is connected to a cognitive computing system, it begins producing data for analysis. The computing system then operates as the equipment's cognitive brain. If a supercomputer is added to the manufacturing equipment, it can use information from the sensors attached to the equipment and implement predictive analytics on things like motor or bearing failure. The machine-learning algorithms in the cognitive computing system look for glitches in a system's performance and actions

By tapping the power of cognitive computing, organizations are moving from IoT vision and proof of concept to strategic deployments aimed at driving real transformation. The result is a new industrial era defined by factories, machines, and parts capable of self-assessing, triggering actions and exchanging information with each other, and with the people who manufacture and maintain them.

Cognitive robotics - a better insight on robotics

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Cognitive systems & cognitive architecture have become an important part of research in general artificial intelligence. The cognitive systems started emerging from 1950 with the goal of creating programs that could reason about problems across different domains, develop insights, adapt to new situations, & reflect on themselves as well as to provide the understanding of brain structure and its functionalities in a natural way. Cognitive robotics may be considered the engineering branch of embodied cognitive science and embodied embedded cognition.It is mainly concerned with endowing a robot with intelligent behavior by providing it with a processing architecture that will allow it to learn and reason about how to behave in response to complex goals in a complex world. Cognition impacts numerous application domains for robotics, including pick & placement, tending, manufacturing tasks, inspection, & collaboration and assistance. The traditional cognitive modeling approaches have assumed symbolic coding schemes as a means for depicting the world, translating the world into these kinds of symbolic representations has proven to be problematic if not untenable. The focus of cognitive architectures is to model the human mind, eventually enabling us to build human-level artificial intelligence. The cognitive systems attempt to provide evidence that mechanisms succeed in producing intelligent behavior & thus contribute to cognitive science. Moreover, the body of work represented by the cognitive systems documents what methods or strategies have been tried previously (and what have not), how they have been used, & what level of success has been achieved or lessons learned, all important elements that help guide future research efforts.

The study has been carried out to understand the various architecture of cognitive systems. The well-established cognitive architectures such as Soar, ACT-R, EPIC, LIDA, CLARION, ICARUS can applied to many biomimetic & neuroscience-inspired cognitive architectures that model cognitive processes on a neuronal level (e.g. CAPS, BBD, BECCA, DAC, & SPA). As a evident of representative surveys carried out in the various fields of cognitive science, cognitive architectures are defined as an outline for intelligence, or, more specifically, a proposal about the mental representations & computational procedures that operate on these representations enabling a range of intelligent behaviors. According to Russell and Norvig artificial intelligence may be realized in four different ways: systems that think like humans, systems that think rationally, systems that act like humans, and systems that act rationally.

The existing cognitive architectures have explored all four possibilities. For instance, human-like thought is pursued by the architectures stemming from cognitive modeling. Recently, claims have been made that deep learning can solve AI by Google (DeepMind). Likewise, Facebook AI Research (FAIR) & other companies are actively working in the same direction. The engineering-oriented architectures pursue a similar goal as they have a set of structural components for perception, reasoning & action, and model interactions between them. The focus in the field of cognitive is basically on embodying, and integration of various capabilities which are necessary for human (-like) intelligence within the identified cognitive architectures. The intention is to subsume many of the capabilities found in the current generation of state-of-the-art architectures – such as Soar & ACT-R – as well as to go significantly beyond them. Yet, the goal is also to accomplish this in a simpler and more elegant fashion – when possible, with the capabilities arising from combinations of preexisting architectural mechanisms & knowledge rather than building new mechanisms – & with adequate efficiency.

Science & technology - recent innovations

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Technology is important part of our day to day life. We get up in the morning from the ringing of our alarm clocks and go to bed at night after switching our lights off. All these luxuries that we are able to afford are a resultant of science and technology. Indeed our existence itself depends on it now. Every day new technologies are coming up which are making human life easier and more comfortable. There is a lot of advancement in the fields of medical, education, manufacturing, and other areas. Moreover, they are not limited to cities, but also rural areas for educational purposes.

India is in negotiations all over the planet since before the British rule. Since freedom, it is the modern technology that enabled India to progress over time. It has become a vital hub of innovative and ground-breaking scientific advances around the globe. In other terms, the Indian economy has been boosted by all the tremendous scientific and technological achievements of our world.

Subsequently, advances in science also led to the development of various fields, like astronomy, astrophysics, space exploration, nuclear power and more. Several beautiful examples of such events were the railway system, smartphones, the metro system, among many others.

India is becoming an essential resource of innovative and fundamental scientific progress in all parts of the globe. All of the significant scientific advances and technical accomplishments have changed the Indian economic condition in our nation. They have provided many new approaches for the future generation to build a technologically sophisticated climate.

Many new technological product developments throughout the areas of mathematics, design, chemistry, science, pharmacy, metalworking, dogmatic theology, physics, farming, medical care, pharmaceutical products, astrophysics, nuclear energy, space exploration, computer, and defence, have been developed.

METAVERSE

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We live in a world which has fortunately or unfortunately witnessed various natural phenomenon. Covid is one among many such disruptions which came as a blessing in many ways and taught us with valuable lessons to survive this pandemic together. This wouldn't be possible if the technologies were not developed and available at our fingertips. Covid also paved a path for new advancements in the field of science and technology. One such technology which became the talk of the town is 'Metaverse'.

Metaverse in simple words can be explained as a virtual 3D universe connecting multiple 3D worlds with the use of Internet. The platform can be used as a medium for social connection using hardware assets like virtual/ augmented reality (AR/ VR) headsets. Many used to believe Metaverse is a myth, and the concept is used in science fiction movies & novels. But Covid proved us wrong, and the earlier assumed myth is now coming to reality with many organizations investing in the Metaverse technology and platform. Metaverse is on the verge of being implemented in various leading organizations with the use of technology elements like Visualization Holograms, 5G's, Spatial computing, Advanced materials and NFT's etc. Organizations that envision to implement Metaverse needs to deep dive and do a self-analysis on seven fundamentals mentioned below:

1. Experience – Bringing the virtual life to reality.
2. Discovery – Provide the functionality of search mechanism for end user within the virtual world.
3. Content – Building the front end of the environment and keeping the creator in loop.
4. Spatial computing – Feasibility of using AR/ VR.
5. NFT/ Blockchain - Decentralization if currency is being involved in the environment.
6. Human interface – Medium for end user to interact like AR/ VR headsets, neural links.
7. Infrastructure–Right platform to build the structure with techno sponsor ready to invest in technology.

Experts believe Metaverse will serve a lot of purpose in the field of Education, taking virtual education to a whole new dimension (moving from 2D to 3D). Metaverse can make a huge impact in the medical field giving doctors a medium to view the MRI scans in 3D helping them diagnose the problem in early stages. The platform can also make in-roads in other high maintenance sectors like aircraft maintenance, technical trainings etc.

With having said all this, we need to understand the challenges faced while implementing Metaverse.

Few of the top challenges include:

1. Security/ identity of the individual.
2. Social ethical problem has been a concern in various 2D environments & ranks among one of the top challenges.
3. Currently Metaverse is not available for especially abled part of the audience.
4. Cost cap on the hardware requirements & may not be feasible for the lower backward section of the society.

To conclude on this topic, experts believe India will become a global hub and play a key role in the technology's development and innovation. Creator economy will be hugely benefitted providing huge job opportunities to the future generation. Invention and discovery of technology is here to stay, and we must adapt to the changes and evolve parallelly with the technologies.

The race to secure connected cars

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Over the past 10 years, the automotive industry has gone through a period of immense rise. The prevailing market players, Traditional business models, and supply chains are all being challenged by a wave of new entrants that are shaking up the market. The rising automobile market has been caused by several trends affecting the industry, which includes autonomous vehicles, electrification of the vehicle network and the growth in shared mobility. While we can say that these might have been the major reasons for unsettling the market, the greatest disruption can probably be pointed to another trend: Connective Technology.

"Remember to lock your car" is no longer sufficient to protect one's vehicle. The infrastructure connectivity among the vehicle can be thought as the ability of a vehicle to communicate with its surroundings. The increased automation, vehicle-to-vehicle, vehicle-to-pedestrian communications and advances in autonomous driving add computer security and data privacy to reliability and safety as for the automobile industry. The fully connected automobile will be made of a connected technologies ecosystem which enables the exchange of large chunks of data while moving at high-speed. The two main pillars of connectivity: Infotainment and Infrastructure needs substantial amount of data to be transferred in both directions. Automotive innovation is driving the need for built-in security solutions and architectural designs to avoid rising threats. The goal for automotive security products is to make sure that the new vehicle paradigm is protected and can operate to its full potential, even in a malicious operating environment. For car manufacturers, suppliers, drivers and owners, the cyber-attacks are now a clear and present danger.

Connectivity Technology: Infotainment

Today, an automobile user may be interested in experiencing all the services and comforts that he would find in a sort of living-room environment. In addition to these functions of information, infotainment services and interaction, modern cars have to provide in an effective way all the traditional automotive commodities. Music streaming, video streaming, in-car wi-fi networks and social networks are some parts of the infotainment system. These services provide a valuable opportunity to develop customer loyalty through personalized in-car experiences. The IoT – Internet of Things is one such technology added in the vehicle which creates additional revenue to the automotive industry. Business can advert to the vehicles travelling in the vicinity and these can be personalized for each person in the vehicle.

Connectivity Technology: Infrastructure

As said earlier, Infrastructure is the ability of vehicle to be able to connect with its surroundings, be it vehicle-to-vehicle or vehicle-to-road-infrastructure or even to the sensors on board. Infrastructure connectivity is fundamental to the autonomous vehicle technology and plays a major role in the safe and efficient use of the transport systems. For the new generation of cars, we need great number of devices to be connected to one another via dedicated buses. These may be the ECUs controlling the behaviour of the vehicle or the Human-Machine Interface (HMI) collecting the driver's input. The Intra-vehicle connectivity is responsible for the data exchange between the sensors and the ECUs, and this is achieved either by wired or wireless networks.

The other form of the infrastructure connectivity is the Inter-vehicle, which is responsible for the transmission of data between different cars, without the intermediation of centralized remote hub. In the latest form of technology is V2I – Vehicle to Internet communication. The modern cars need to have access to internet to experience dedicated services and access to multimedia data. These whole set of communications can be called as V2X communication.

Looking to the Future:

These recent advents in the connectivity technology have been something of a Trojan horse for the tech companies, granting access to the market for the largest companies to deep dive in these technologies. These entertainment services which started as a basic service are now evolving into a ubiquitous requirement to make sure the customers and the vehicles stay connected.

Emergence of SiC in automotive industry

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The world is moving towards Electric vehicles (EV) from the conventional IC engine vehicles. The power rating of the EV motor has increased from 80kW to 200kW in a very short span of time. Fast charging is now considered as an essential feature for an EV as the customer does not want to wait to charge the battery. Power converters used in EVs should be compactinsize, expected to be light weight in order to reduce the load on the motor, increasing efficiency and increase the battery range. They are also expected to operate continuously at high temperatures without failure i.e be reliable.

These requirements and features are difficult to be met with existing Si based devices as they are nearing their theoretical limits interms of switching frequencies, blocking voltage levels, efficiency and thermal capability.

SiC devices (MOSFET and IGBT) have emerged as an alternate to the Si counterparts. SiC belongs to the family of Wide Band Gap (WBG) semiconductor devices. WBG devices have a wider bandgap in their structure compared to Si. Some of the advantages of WBG devices compared to Si devices:

- WBG semiconductor-based unipolar devices are thinner and have lower on-resistances. Lower Ronal so means lower conduction losses; therefore, higher overall converter efficiency is attainable.
- WBG semiconductor-based power devices have higher breakdown voltages because of their higher electric breakdown field; thus, while Si Schottky diodes are typically at voltages lower than 300 V, SiC Schottky diodes are already rated at 600V.
- WBG devices have a higher thermal conductivity (4.9 W/cm-K for SiC compared to 1.5 W/cm-K for Si).Therefore, WBG-based power devices have a lower junction-to case thermal resistance, Rth-jc .Thus, more heat can be easily transferred out of the device, and the rise in device temperature is slower requiring smaller heatsink.
- WBG semiconductor-based power devices can operate at high temperatures. The literature notes operation of SiC devices up to 600°C. Si devices, on the other hand, can operate at a maximum junction temperature of only150°C.
- Forward and reverse characteristics of WBG semiconductor-based power devices vary only slightly with temperature and time; therefore, they are more reliable.
- WBG semiconductor-based bipolar devices have excellent reverse recovery characteristics. With less reverse recovery current, switching losses and electromagnetic interference (EMI) are reduced, and there is lessor no need for snubbers.
- Because of low switching losses, WBG semiconductor-based devices can operate at higher frequencies(>20kHz)not possible with Si-based devices in power levels of more than a few tens of kilowatts.

Wider bandgap means these devices can operate at higher voltage levels, higher switching frequencies, higher efficiency, with better thermal capabilities leading to high temperature operation.

Adaptive traffic control systems (ATCS)

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In modern world the traveling has become an integral part of one's life. It may be in between home to workplace, home to school/colleges, tourism and travel to market or any other places through vehicles in particularly road transport. As vehicles increases there will congestion in vehicle movement due to limited road infrastructure which can't be constructed parallel along with increase the vehicles. So the travel time between the one's places to destination matter's a lot which in turn affects the fuel consumption and one's precious time. So as to overcome this problem modern type of traffic control system namely Adaptive Traffic Control System can be incorporated in densely populated areas like Metropolitan cities, Link highways, Twin cities and Urban areas with large numbers of commuters on daily basis.

AdaptiveTrafficControlSystemdesignedtooptimizetrafficflows.Itoffersawiderangeofstrategies designed to suit any road network and unpredictable traffic condition. It operates in the fully adaptive mode, constantly monitors and forecasts the traffic status of particular location or junction and optimizes control strategy according to vehicle densities.

The system has unique feature of selective priority for public transport. Once the presence of a bus is detected on a lane, it gives the selective priority and special clearances in the ongoing cycle. Thus, reducing travel time which also encourages people to use public transport and help in reduction of traffic congestion to a greater extent.

Some features of Adaptive traffic control systems are as stated below:

- Real-time optimization of traffic signals.
- Absolute or selective priority for public transport.
- Can be connected to pedestrian pushbutton systems at Pedestrian Mid block.
- Can be connected to Central Command Centre for monitoring and remote updating of any strategies or any plans in the ongoing cycle, to generate statistical reports and check any issues or alarms related to system.
- Background running software Composite Signal Control Strategy (CoSiCoSt) co-ordinates in between selected corridors or junctions so as to give continuous green time or synchronize the signal plans.
- Immediately warns of malfunctioning, enables rapid intervention for maintenance.

So on proper utilization of this multi branched engineered technology, future urban development plan can be ensured. This system can also give productive credits to Smart City vision, good monitoring and enforcement facility to Police Authorities and can create thousands of job opportunities for Electrical and Electrical Engineering, Electronics and Communication Engineering and Civil Engineering Graduates. Presently this sector holds Road Transport Engineering with detailed education and case studies. The very best examples of this system which are running successfully in Indore Bus Rapid Transport System and Hubballi-Dharwad Bus Rapid Transport System (HDBRTS). Many Metropolitan city corporations are planning for the modern type of traffic signal system so as to replace the existing conventional system.

Glass fibre - reinforced plastics

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Differences between glass fibre-reinforced plastics. Glass fibre-reinforced plastics can differ in terms of their composition, shapes or the manufacturing process. I have summarized the differentiation within GRP for you. Whether in composition, shape or manufacturing process, glass fibre-reinforced plastics (GRP) can differ as much as night and day. The quality and manufacture depend on the form and purpose of GRP. I have tried to summarize the key differences for you.

All GRP are not the same

Automotive engineering in particular has long relied on glass fibre-reinforced plastic. Mechanical engineering and other industries are also recognising increasing potential, as the material has many advantages over conventional materials. Strength and formability are at the forefront of its capabilities. GRP also scores highly with its excellent weight/strength ratio. This is particularly important when the material is used for the production of components. The differences in GRP begin before the manufacturing process, during the composition of the material and extend to the finished product. I have summarized for you how the composition of GRP can differ. We will also show you the forms that GRP can take and the differences that exist in the manufacturing process.

Composition determines the characteristic features

GRP stands out among materials in particular as it is light but extremely robust. This is due to the special composite of glass fibres and a plastic matrix. The matrix gives the fibre composite material its appearance, while there are few limits to the colour and the surface structure. From a mechanical perspective, the matrix must hold the reinforcing fibres in place and transfer and distribute stresses between them. In terms of durability, it has the task of protecting the fibres from external mechanical and chemical influences. The size of the glass fibres is also important here. This must be compatible with the matrix resin in order to ensure that the fibres and the matrix bind. In the composition of the raw materials of GRP, unsaturated polyester resin or epoxy resin is usually used as a matrix. The easiest way to choose between polyester resin or epoxy resin is to compare the advantages and disadvantages of polyester resin and epoxy resin.

Unsaturated Polyester Resins (UP)

Polyester resin is easily processed with glass fibre mats. The main reasons why glass fibre textiles and polyester resin are so compatible are the excellent impregnation and fibre bonding. In addition, polyester resin is cheaper than epoxy resin and is easier to handle and generally easier to process. Unsaturated means that long, non-cross-linked polyester chains are still responsive because they have unused double bonds. If these are then reacted with the also unsaturated styrene, for example, this causes a cross-linking of the chains. This cross-linking reaction is called curing. The hardener quantities depend on the process and are determined by the manufacturer in complex tests. Depending on the choice of primary materials and mixing ratios, variable degrees of cross-linking are possible with UP resin, i.e. end products with varying hardness.

However, caution must be taken: The cross-linking reaction is highly dependent on the formulation and process and errors can lead to insufficient material characteristics. In addition, an odour characteristic of UP resins forms during curing. This is due to the fact that the styrene contained in the polyester resin evaporates to some extent during curing and, on the other hand, a small proportion of residual styrene remains in the final product. The odour threshold of styrene is in the ppm range. Polyester resin combined with reinforced fibres also has less pronounced mechanical properties than epoxy resin.

Epoxy Resins (EP)

Epoxy resins can score points by having more pronounced mechanical properties when combined with reinforcement fibres. This is mainly due to the fact that epoxy resin has excellent adhesive properties, which are also illustrated by strong fibre adhesion. In addition, epoxy resin shrinks less during curing than polyester resin, which is particularly advantageous in tool and mould making. Epoxy resin is also very popular for indoor use, as it is generally odourless. Epoxy resin does a good job not only in dry conditions, but also in water. Epoxy resin is highly resistant to hydrolysis. This also helps the EP resin to retain its structure in the water. That's why epoxy resin is also perfect for GRP parts exposed to water.

However, even epoxy resin is not perfect and has some disadvantages. The exact epoxy resin/epoxy hardener ratio must be maintained when mixing. Addition of excessive hardener leads to brittleness of the component, while insufficient hardener hinders full curing. In addition, epoxy resin can only be processed to a limited extent with glass fibre mats. This is because the binder in glass fibre mats weakens the matrix and if the binder concentration is high, the mechanics will suffer. It is therefore recommended that epoxy resin is processed with glass filament woven roving, glass fibre non crimp fabrics or carbon woven roving.

Comparison of EP and UP

	Epoxy Resin (EP)	Unsaturated Polyester Resins (UP)
Advantages	• better mechanical properties • excellent chemical resistance • excellent adhesive properties on various substrates, such as wood, metal • excellent fibre adhesion • low odour nuisance, making it more suitable for interior use • hardly any shrinkage during processing + very good suitability for mouldings • exclusion of osmosis damage, thus good suitability for boat construction and boat renovation	• easier processing • cheaper price • faster curing • wide range of product properties thanks to good miscibility • high pigment compatibility and therefore good colourability • adjustable and high UV-resistance
Disadvantages	• accurate addition of hardener required when mixing • greater cost than polyester resin • slower curing • allergy potential	• strong styrene smell during curing • limited mechanical properties • some shrinkage during curing

Differences in the glass fibre composite

It is not only the matrix that plays an important role in the composition, the choice of fibres is also decisive for the final product and its properties. The fibres give the fibre composite the necessary strength. In addition to tensile strength, bending strength can also play a role if the material is subjected to pressure. Since the fibres can be aligned according to the load and their density, i.e. the number per area, can be adjusted, tailor-made components are created with the help of appropriate production processes.
There are various textile forms that are distinguished in the glass fibre composite: nonwovens, mats, woven roving and non-crimp fabrics.

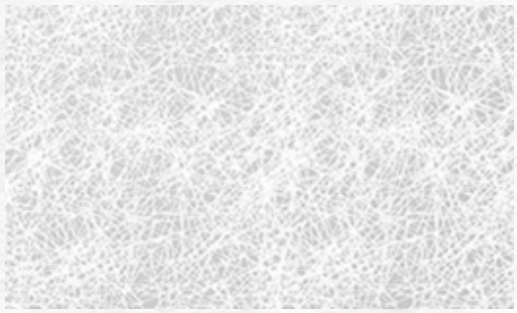
Nonwovens

Nonwovens are fine, short glass fibres that are separated from an emulsion, for example, and solidified into thin surface goods.

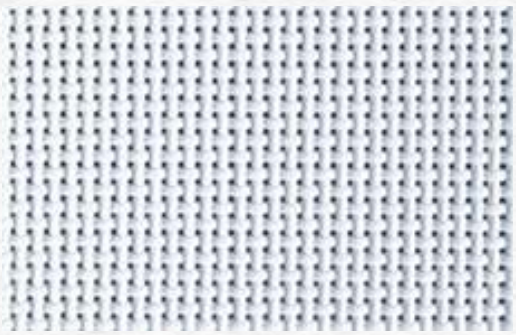
- short, tangled glass filaments
- very light – e.g. 20 g/m2
- comparable to paper
- visual improvement of the surface

Mats

Mats are made of cut glass fibres approx. 5 cm long or endless glass threads, which are continuously layered and bonded by a binder. If the glass fibres have already been formed as coils before the GRP production process, they are referred to as mats.



- various grammages (area weight): 200-500 g/m2
- randomly layered glass fibres, bonded with binder:
- "Chopped glass mat" or "chop mat" standard
- "infinite" fibres: better mechanical properties, but much more expensive



Woven Roving

Glass fibre rovings or yarns that are combined with fabric with different woven patterns are referred to as woven roving. In the case of woven roving, the strands are not bonded together. A roving is a bundle of fibres that are not connected to one another, but just lie next to one another.

- different grammages (area weight): 200-1000 g/m2
- Available as yarn or roving fabric

Non-crimp fabrics

In a non-crimp fabric, the glass fibre strands lie parallel and stretched into one or more positions. The positions are fixed at cross-over points by additional threads, usually made of polyester.

- different grammages (area weight): 100-1000 g/m2
- multi-directional arrangement, i.e. fibres in longitudinal and transverse direction and also in both diagonal directions (0°, 90°, 45°)

Differences between glass fibre composites

	Glass fibre woven roving	Glass fibre mat
Advantages	• higher structural strength than laminates with a glass fibre mat • higher glass fibre content than laminates with a glass fibre mat, thus less release of resin • very good for use with epoxy resin	• easier to process • cheaper than glass fibre woven roving • very easy to process with polyester resin
Disadvantages	• more expensive than glass fibre mats • must be layered symmetrically to prevent internal tension	• lower structural strength than laminates with glass fibre woven rovings • can only be processed to a very limited extent or not at all with epoxy resin • higher resin content and lower glass fibre content

Different forms require different manufacturing processes

GRP is used in a wide range of application fields from the automotive industry to the building industry. Whether the smallest of cables or entire aircraft parts – GRP can take very different forms. In principle, glass fibre-reinforced plastics can be divided into three groups in which they are finished or produced for further processing.

- Mouldings
- Sheets
- Coils

Depending on the shape and use of the component, a distinction can be made between different production processes, which specialise in producing GRP either as an individual moulding, sheet or coil. Four different manufacturing processes are distinguished.

Sheet Moulding Compound (SMC)

Sheet moulding compound, also known as SMC, refers to typical press compounds made of thermosetting resins and glass fibres for the production of fibre-reinforced compounds. The SMC mass contains the necessary components that are fully premixed for processing. Polyester or vinyl ester resins are generally used. The reinforcement fibres are available in mat or woven roving form.

Applications for SMC

SMC is used to manufacture body parts for passenger vehicles, sports equipment, the electrical industry, the sanitary industry and the aerospace industry. Fasteners can already be inserted into the press mould during pressing. This makes SMC particularly economical. The fillers are used to reduce weight and costs.

Bulk Moulding Compound

Bulk Moulding Compound, BMC for short, is a fibre-matrix semi-finished product consisting of short and long fibres. More precisely, it mostly consists of short glass fibres and a polyester resin. BMC is available as a dough-like, shapeless mass and is supplied in bags or other containers. Processing takes place in the hot-press process. The BMC mass is placed centrally in a heated, split tool. By closing the tool, the BMC is distributed and forms the desired product. Due to the short fibre lengths, thin ribs and wall thicknesses can also be filled during pressing. With correspondingly short fibre lengths, BMC can also be processed in the injection moulding process.

Applications for BMC

BMC is primarily used in the electrical sector. It is processed into switch components for low- and medium-voltage devices, where the specifications for switching performance and flame resistance are high. In the automotive sector, BMC is mainly used for headlight reflectors and carburettor housings.

Continuous Production Process

The continuous production process is a production process that ensures particularly high quality. LAMILUX Composites specialises in this process. GRP coils are manufactured on flat conveyor systems that are more than a hundred metres long. Due to the high degree of automation, which ensures that the different material variants can be reproduced at any time, the systems are the most modern of their kind in Europe. Throughout the entire production process, the production standards are safeguarded by seamless quality management. In addition to monitoring the process, this also includes intensive laboratory checks of incoming raw materials and final materials.

Manual Lamination

Manual lamination is one way of manufacturing complex components from fibre-reinforced plastic. Sizes vary up to that of gliders and recreational boats. This manufacturing process requires a negative form of the component to be manufactured, the required fibre fabric, for example glass fibre mats, and the matrix, for example epoxy resin. The two materials are then alternately distributed by hand in the mould. During production, it is essential to ensure that the two components are well mixed, that the fibres are saturated with the matrix and that there are no air pockets. Afterwards, the component must either harden cold in the air or hot in a hardening oven. Hot hardening creates higher strengths and accelerates the curing process.

How AR & VR are transforming construction industry

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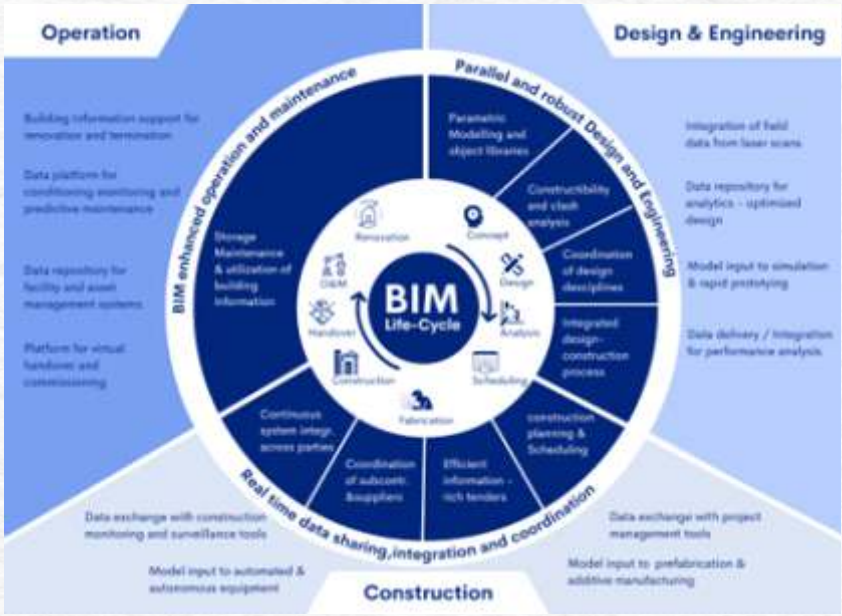
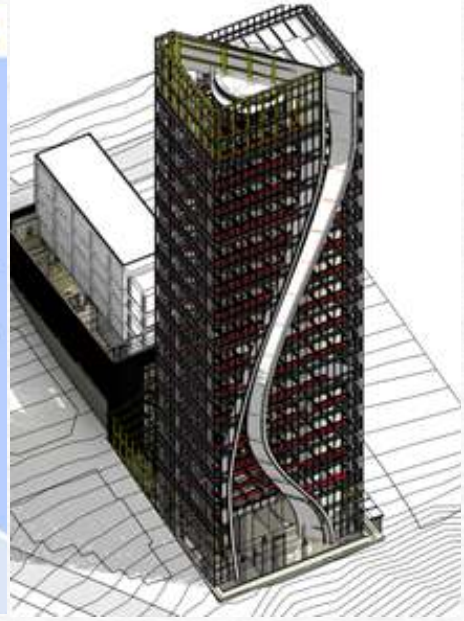
Today, India being one of the six fastest growing economies of the world & the 'Construction industry' serving as a major contributor, is in great need of digitalisation. Digital transformation is a key priority for solving challenges in processes, business models, and ecosystems of the construction industry. The global construction industry has always been one of the last industries to adopt new technologies, may it be the digital twins, pre-fabrications, 3D Printing or the AR/VR - all of these buzzing words are in other industries from quite a long time, but now they are being looked at in the perspective of Architecture, Engineering and Construction (AEC) industry in the recent years, & now, this shift is at a faster pace.





In this direction, The BIM (Building information modeling - a process of generating, storing, managing, exchanging, and sharing building information) is acting as a key in digitizing the construction industry, It is enabling various project stakeholders to create information-rich virtual models that help better to visualize building projects. But the BIM models that we produce are of massive scale and complexity. This hyper connected ocean of complex data can really & effectively be converted into an experience through the immersive technology AR & VR. This enables us to finally deliver an experience in the field.

We can't really absorb the details of the actual site or interact with the objects with the traditional 2D drawings and the advanced 3D BIM Models. Though they are predominant for design communication, they often only offer a limited sheltered glimpse of a full experience. What if you could experience beyond that? Virtual reality & Augmented reality brings that opportunity to bridge that communication gap in this fragmented industry.

For those to whom this technology is new, I will just brief you about the terminologies AR & VR.

Virtual reality (VR) - It is a computer-generated environment that someone can explore and interact with. To put it in simple words - here, a user wearing a VR headset is immersed in the virtual environment to get a 360-degree view of the virtual world.

What if the physical environment is enhanced with the digital content, it is Augmented reality (AR). It allows the virtual elements or the information - to overlap in the real world. To experience the AR, the user can use any digital screen, such as smartphones, tablets, etc.

AR VR usage is not so new, they have been in the gaming industry for quite some time. Outside of just the gaming and entertainment Industry, AR & VR Technology is productively being used in many industries,, listing out a few is

Manufacturing & Automobile industry where it helps the vehicle manufacturers to optimize their assembly lines.

Healthcare

When it comes to surgery or operations, precision is very much important. AR healthcare softwares gives X-Ray vision directly to the surgeons, helping in locating a tumor in the liver or any serious problems at a very early stage & hence saving lives.

Retail - retail companies such as IKEA, Walmart, and others are driving the ARVR market in recent years, like if you see IKEA is already using AR for home goods and furniture retailing, allowing the customers to manipulate and place the goods at their home scale and thus attracting more consumers.

Education - by making learning immersive, AR VR promotes student engagement and nurtures a better understanding of the subjects.

Real Estate - The biggest impact of AR/VR in real estate will be in “Virtual reality property tours”, the user will feel like he or she is in the actual physical home that is shown through the VR experience.

How AR & VR is being used in the Construction Industry - Will brief you stagewise. The three predominant phases of the lifecycle of any infrastructure is the design phase, on-field construction phase, and the operations and maintenance phase.

In Design phase

1. Visualize and interact with your design before constructing.

An Architect / Engineers can foresee and experience his design & can have a better understanding of buildings even before they are built. Virtual reality enables Architects/engineers to pre-visualize their design, so that the output is suitable from all aspects, not only in functional but also in aesthetics. VR enables the designer to try & test different design permutations and combinations, Identify potential constructability issues, perform quick measurements, add notes, and document errors in real-time with the life-size, live model walkthroughs. VR also makes it easier for the client to understand the designs created. That means no more delays in the design approvals.

2. Collaboration within Teams

Collaboration with various project stakeholders or even within the team has always been a major issue in the construction industry. Virtual Reality makes it easy for the team members to collaborate and coordinate at 1:1 scale and helps you go from design to construction more efficiently. We can share, communicate, and collectively interact in real-time with easy-to-understand visualizations. In the real world, immersive technologies have unearthed a power to solve key communication gaps.

Next comes the intermediate stage - On-field Construction Phase

1. Try and test in AR

The beauty of AR is, the design output can be overlaid as the virtual content on the physical site environment. This enables us to Pre-check installation plans with the current as-built to identify potential clashes, Ensure accurate fit of the pre-fabricated parts - before sending the orders to manufacturers. Even the underground plumbing service markings, as you can see here, can be done accurately using the overlaying the design model. Normally, concrete conflicts become a reality in the construction site, when the construction process is in progress. At that moment any eventual error reverts to additional cost and time delay, such boundary-pushing concepts can be tested and refined at this interactive virtual world, before committing to real-world construction.

2. Training the Construction Workers on Safety & the work process.

Construction workers can themselves get familiar with the work with the help of AR/VR devices in the construction site, where they can experience real-world situations without any of the associated safety risks, by using work instructions, prepared training sequences or “remote assistance” directly from the experts,, especially for prefabrication builds we can train new workers on how to assemble components in a digital environment, with this the employees get up to speed faster with fewer errors and more confidence during actual construction.

During the Operations and Maintenance phase.

1. Resolving Building Service Requests

AR & VR technology can also be used as an intelligent solution in operation and maintenance. Finnish company Grunlund - Our esteemed partners in offering BIM for Facility Management, providing Energy management, maintenance management & asset management solutions, have developed the software which enables AR for FM.

- Occupants of the building can raise any issues related to Building maintenance by Scanning QR code from his mobile camera application.
- We can add the issues, with description - attach a photograph and submit the issue.
- Since QR codes are location specific, we need not have to tag location, on receiving the Service request, the concerned team will launch the AR application. He can visualize Building Services in the application, He can click to get that asset or space information. can filter and select specific service requests based on priority & the application will guide him to the exact location, where he can act on the issue & mark as Completed.

2. Tracking Above Ceiling or under floor services - for any retrofit planning.

For the Pre Existing buildings undergoing renovation or carrying out retrofit activities, the hidden above ceiling or the underfloor services, may it be HVAC, Electrical, Fire fighting or PHE can be easily tracked with virtual models overlapped in the physical environment by using augmented reality. The system could project the maintenance history record and relevant maintenance manuals for an asset, whilst also displaying information regarding on-site parts.

We at Desapex have been investing in these tools and technology right from our inception, we use professional - grade AR & VR devices. And we have also set up Virtual Reality Labs for our clients in their facilities enabling them to experience their property in this amazing technology.

Recent trends in science & technology

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Technologies, has a dominating factor in shaping the competitiveness of enterprises, require a careful insight into the scope their development. It is both crucial to identify available technologies, select appropriate solutions as well as perform activities connected with chosen technologies. Modern enterprises are forced to monitor emerging market trends within new technologies. The enormity of appearing technological solutions also necessitates the need to estimate their value, accounting for the complexity of technologies, their systematic character and relation. Customer expectations and needs determine shortening of the product's life cycle, as well as the cycle of technology application. Technologies become a dominating element in raising competitiveness of the enterprises that use them. Observing the development of technologies, in turn, protects the interrelated investments to some extent. It appears logical to necessitate the search for the adequate mode of technology management.

Trending Facts in Technology are:

- 3D Printing Molecules
- Adaptive Assurance of Autonomous Systems
- Beyond 5G Hardware
- New Approaches to Data Interoperability in IOT

Trending Facts in Science are:

- Regenerative Medicine
- Bioinformatics & AI in 'omics'
- Cellular Senescence & Life Extension
- Bio Robotics/Bionics

Trending Facts in Environment are:

- Energy Efficient Water Treatments
- Algae Against Climate Change
- High Temperature superconductivity & Twist Electronics
- Self-Healing Batteries
- Arctic Climate Change

Technologies comprise a dominating element in raising competitiveness of the enterprises that apply to them. It is technology that modern enterprises base their activities on while creating a strategy that is to secure a competitive advantage and aiming at an adequate position on the market. Subsequently, the life cycles of both the product and technology use are shortened, and a great impact is placed on skilful technology management. Therefore, it seems important to monitor emerging research trends undertaken within technology management. This approach also indicates two mechanisms – technology push and market pull, according to which, technology might be an effect of research projects conveyed in scientific units or might be a response to emerging entrepreneurs and society demand for concrete solutions. Here, a new issue of quality management became much more popular, combined with service operations and certification. The aspect of intellectual property, still mentioned and developed, was most often associated with the term patents. However, there appeared other new issues associated with biometrics and social network analysis.

Current trends in science & technology

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Science and Technology have introduced us to the establishment of modern world. This development contributes greatly to almost every aspect of our daily life. Hence, people get the chance to enjoy these results, which make our lives more relaxed and pleasurable. This also contributes to society is the creation of new knowledge to boost the prosperity of human lives, and to solve various issues facing society.

The Technology has made it easier to farm, more feasible to build cities, and more convenient to travel, among many other things, effectively linking together all countries on earth, helping to create globalization, and making it easier for economies to grow and for companies to do business. The impact of science and technology on modern society is broad and wide ranging, Influencing such areas as politics, diplomacy, defense the economy, medicine, transportation, agriculture, social capital improvement, and many more. The fruits of science and technology fill every corner of our lives. Modern technology has paved the way for multi-functional devices like smartwatch and the smartphone. Computers are increasingly faster, more portable, and higher-powered than ever before.

The advantages of these technology include: the ability to develop new, innovative approaches; more effective marketing and promotion; new sales avenues; less wastage; more efficient manufacturing techniques. The Disadvantages include: increased dependency on technology; required regular updates; increased risk of job cuts etc.

Thus these knowledge allows us to make new observations about the world, build more scientific and technical knowledge, and build new technologies. Science and Technology makes us think differently, feel differently, and even built differently.

Use of silica beads in grain storage structures

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The importance of Silica beads plays a vital role in keeping things/products dry by absorbing moisture. To give a consumer the product in its best form, many manufacturers add desiccant packs, which keep the product moisture-free and fresh. Silica gel is amorphous with stable chemical properties, adsorptive substance, and porous structure of silicon dioxide (silica). Silica gel material occurs in nature as sand consisting of an irregular tridimensional framework. Silica gel is non-toxic, non-flammable, non-reactive, non-corrosive, and odourless. Silica gel with lower energy costs provides a large volume of desiccant dryers of premium quality, and for ordinary usage, it offers good stability. It provides good thermal stability and chemical characteristics when compared to different desiccants. To prevent the melting and shrinking of the packet material, the silica gel in polyethylene non-woven packets are made to condition with a temperature less than 90°C. The best drying method is by putting the gel on a cookie sheet. Seed drying requires heat transfer because seed can only be dried by evaporating moisture from the surface, and the liquid water has less heat content than moisture vapour. Seed moisture content and storage temperature mainly control the endurance of seeds. Seed viability can be drastically reduced by drying it at a very high temperature or rapid drying. The major application of drying for the preservation of grains following the invention of agriculture and increasing human dependence on cereals. Drying plays a significant role in the conservation of grains through various recent scientific innovations in agriculture and also due to day-to-day increasing dependency on cereals.

The primary reason for storing economic plant seeds is to preserve planting stocks from one season until the next. The static method helps in determining the equilibrium moisture content of seeds. Static method may usually take from a few days to 2-3 months for seeds to reach equilibrium moisture content with the surrounding atmosphere. But whereas, in the dynamic approach, the air is made to be in motion and circulated around the sample. Here, the difference between the seeds' vapour pressure and the surrounding atmosphere is crucial in determining the rate at which moisture movement happens. Seed's storage life of seeds is affected by factors such as man's treatment and handling method, seed characteristics, and inherent conditions resulting from different natural causes.

Fungi-based deterioration of stored seeds is mainly controlled by drying them to a safe moisture content before storing them in a dry place. Humid climates pose a challenging problem for drying large quantities of food grains and seeds and securing them from rehydration. Seed storage life gets affected by the vigour of seeds during storage. Seed lots that quickly deteriorate in such situations, vigour and viability cannot always be differentiated in storage experiments. Seed longevity gets affected mainly by the seed moisture and storage temperature. Use of desiccants that can absorb moisture and bind it strongly paves for the way another assortment for seed and commodity drying in humid climates. Dry Beads help to absorb 20–25% of their dry weight in water and, when saturated, can be fully reactivated for reusing by heating them again. With all the advantages, silica gel(forced air-based) as a desiccant is widely used in the seed industry to dehumidify storage rooms and dry the seeds.

Bacterial concrete

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Micro-cracks are the prime reason for any structural failure. These microcracks need to be prevented, so that the structure can be used for its design life. There are various techniques available in the literature that can be used to prevent these microcracks. The bacterial concrete is one such techniques being used to prevent the structural micro cracks, thus improves the durability of the structure. The bacterial concrete is also considered to be one of the materials for sustainable structures. The knowledge of biochemistry and the civil engineering are important to produce this type of concrete.

In this type of concrete microcracks produced will be healed up by the bacterial action. This technology has applications in the various domains of civil engineering such as structural engineering, pavement engineering and for the construction of hydraulic structures. There are various bacteria are used in this type of concrete such as Bacillus and E coli. The application of these bacteria would be either a directly or by encapsulation process.

In the direct application process the bacteria is added directly to concrete while mixing. The bacteria are not activated until and unless there is micro-crack. Once the microcrack occurs in the structure due to varying climatic conditions, the bacteria come in contact with water and gets activated. During this stage the bacteria produces limestone by consuming the free calcium lactate present in the concrete. The production of this limestone by the bacteria results in sealing of the microcracks of 0.5 mm width. It is the cheap and best method to improve the self-healing capacity of concrete. However, the method will not improve the strength properties of concrete significantly when compared to the encapsulation method. It is reported that about 12-15% increase in the compressive strengths of bio-concrete prepared using the encapsulation method.

These bio concrete has several advantages such as this type of concrete can self-heal the cracks without any need of repairs. The structures built using this type of concrete would have better life than the structures built with other concrete types. This type of concrete would improve the structural capability of RCC structures as the steel bars are not exposed to atmosphere. However, this type of concrete needs almost double initial investment for production, handling and use from skilled labourers. Also, there are no standards available for mix design in India. Thus, it can be concluded that the structural engineer has to decide whether to use this Bio-concrete or not based on the type and importance of the project.

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Plastic wastes in flexible pavements

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Plastic has become the biggest threat to the environment and an unavoidable necessity for humans. There are various methods that are being implemented for the disposal of this waste plastic. One of the ways that civil engineers found was to use this waste plastic in the construction of pavements. In India, about 34,000 km of roads are constructed using plastic wastes. However, only 703 km of National Highways are built using plastic wastes. In the Bangalore University campus, the roads are constructed using plastic wastes.

The plastic wastes that are used in pavements include wastewater bottles, carry bags and wrappers. There are two processes being followed for the use of waste plastics in flexible pavements. The waste plastics are first shredded and added in dry condition to the aggregates; this process is called the dry process. In the wet process, the waste plastics are added to the virgin binder. Many articles are available in the literature that reports that the addition of plastic waste by the dry process has no significant influence on the properties of bituminous mixtures, such as Marshall stability, optimum bitumen content and other Marshall properties. However, it is reported that the addition of plastic wastes by the wet process significantly improves the Marshall properties of bituminous mixtures. The literature also reported that the addition of plastic wastes also improves the rheological properties of the virgin binder. It is observed from the literature that the addition of waste plastics by dry process results in an improvement in stability values by 2.5 times that of conventional bituminous mixtures.

The flexible pavements constructed using the plastic wastes would have smoother surfaces, longer service life, lower maintenance, and reduced construction cost due to the reduced optimum binder content. The use of plastic wastes significantly improves the life cycle cost of flexible pavements. The two major distresses that occur in the flexible pavements can be avoided with the use of plastic waste in pavement construction. It can be concluded that the use of plastic wastes in pavement construction would solve the problem of disposal of plastic waste and would be a sustainable solution from both the environmental and pavements point of view.

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Transformation in contract award for construction projects - design build operate transfer (DBOT)

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The purpose of this technical article is to provide brief information about the Design-Build–Operate-Transfer (DBOT) Contracts. With different routes, the designing, construction and maintenance of a building may be procured. The long-term objectives of the proposed construction projects depend upon the route selected. The general form of a Public-Private-Partnership project (PPP) is Design-Build-Operate-Transfer (DBOT), which proposes the appointment of a single contractor or individual proprietorship firm or construction company which will involve in designing, building and operation of a project on behalf of the government authority as a client and is transferred to the client back to maintain by the client after an agreed time period by the contract which is mentioned by the agency during the agreement.

The DBOT associated services include the major infrastructure works of transportation networks, water resources, major buildings, water supply works, etc.. In India, many Rural Water Supply (RWS) schemes through Multiple Village Scheme (MVS) in DBOT are in the phase of planning, and execution, which are the basis for Jal Jeevan Mission (JJM), a project of the Government of India.

As per DBOT, the contractor should involve in the designing and building of the project, which vary it from the Build-Operate-Transfer (BOT) which is one of the contract routes, but in DBOT, the contractor is involved in the designing, building and operation of the project. Some clients are attracted by the DBOT mode, as it assigns responsibility by a single agency for delivering the project and tackling the project through various steps of operation. Also, DBOT differs from a Design Build Finance Operate (DBFO) contract in which the contractor will finance the project and leases it for an agreed period of 5 to 30 years, after which there will be reverting of development of the project to the client.

The DBOT also vary in terms of expenditures, i.e. cost as it allows the client a certain amount of control because the contractor generally agrees to take on the responsibility of the project for the design and construction for a pre-agreed price in the agreement. This leads in increased financial risk to the contract agency which reflects in the price quoted by the contractor during the agreement. Here, as the contractor is responsible for the design, execution and operation, they may make cost savings which will have impact on quality. In DBOT, there may be exploitation of a specifications by the contract agency that is open to interpretation and choose the cheapest route which is a disadvantage related to quality of work. This means that there will be quality compromization if the employer's requirements do not adequately ensure the anticipated specifications are adhered to. Another risk of DBOT is that the client may have to pay more if the contractor has to take on an unreasonably high level of financial risk due to a lack of design clarity when tendering. In DBOT, it is also important to consider any request for changes in design from employer because the changes will have cost and time implications which is a disadvantage related to design flexibility.

Augmented reality in civil engineering

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Augmented Reality (AR) is the one the Industry 4.0 technology it allow us to impose of computerized imagery over the active, real-world. It has numerous of industrial sector applications since 1950. AR provides a civil engineer to situate the 3D modelling of a future plan on a live space, which gives an augmented vision of the entire civil engineering plan to the user. The visual modelling of actual plan as well as the elevation looks like, upon finishing point helpful in the clients and potential projection picturise the civil engineering plans with the better enhancement.

AR profitably numerous used in the field of the design developments and make it easier by giving the opportunity to touch and cheerful communication. Along with that it also provides us the best among the best spatial consciousness of the finished plans. It also provides a opportunity for fine-tuning and alteration. In addition to the complete model are to be rapidly transformed and experiment with diverse colours palette also with blueprint, equipment of buildings, and facades of building, along with the potential are modified. It can also be utilized for optimizing the design for the superior use of vacant spaces, by prevent all type of waste of space. Beautiful and the attractive 3D model also be formed using AR, it help the designer while recognizing the and modifying the flaw, While designing. In addition, to the technique it is helpful in coming up with pioneering designs, as the construction engineers are able to imagine the configuration of the structure, healthier and number of favourable prices.

Usage of the AR will decrease the error that can be tending to happen whenever we execute the accepted civil engineering sketches. The error also be caused by various factors they are false impression of drawing, calculative error, etc. Such type of error can easily be reduced by using AR, which helps in the permanent watching and review of the building work in order to make sure that it completely as per the standard plans. it reduces the probable problems as well as eliminate the labours and time needed for correction of such mistakes, this saves the plenty of timings and precious man-power.

IoT in agriculture investigation on plant diseases and nutrient level using image analysis techniques through wireless sensor networks

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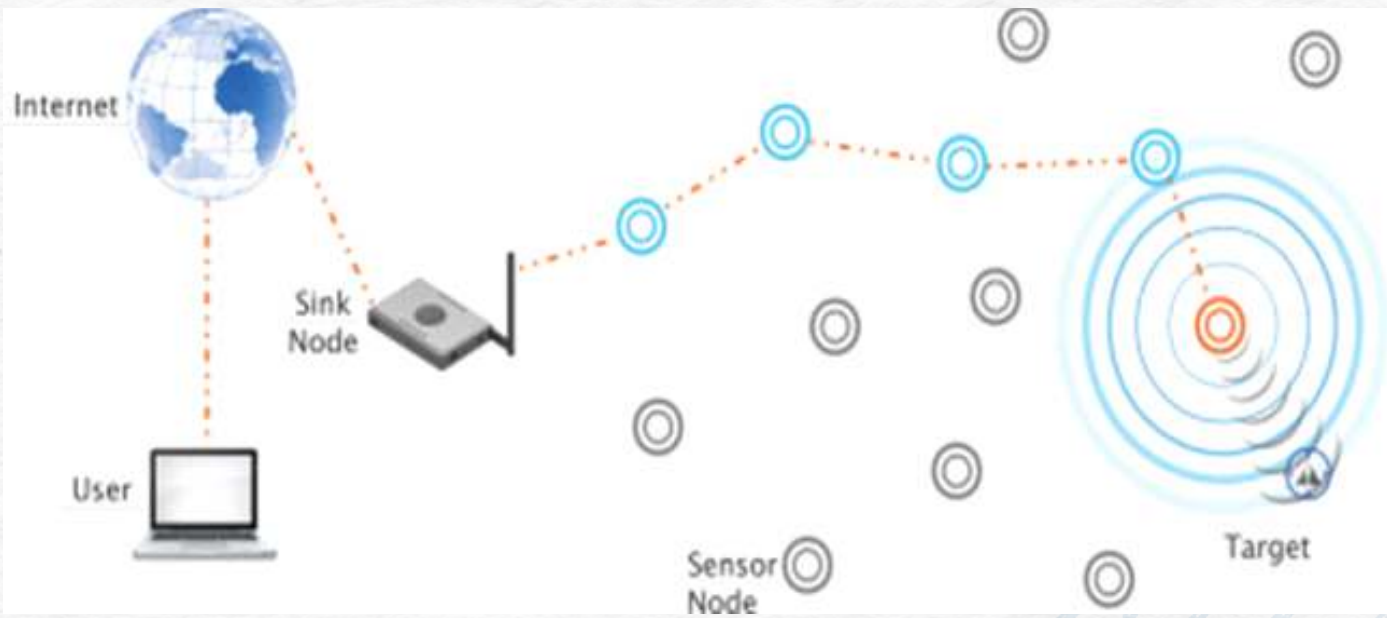
WSNs became widely popularized in the 21st century. They consist of a collection of sensor nodes interconnected via a network. The infrastructure design of WSN is not very complex: the collection of sensors equally monitor an area and provide analysis reports on it. Unlike other network systems, a WSN has its own design and resource limitations. The limitations are less processing power, limited range of communication, and storage issues.

But with so many sensors connected to the network, these limitations are not a concern. Intercommunication of different sensors is achieved through radio frequency waves in an ad hoc fashion. WSN sensor nodes consist of microcontrollers, radio frequency receiver and transceiver, power source, and memory.

WSN sensor technology is used for precision agriculture, with a collection of sensors monitoring the level of water, the right location, and the proper time to start cultivating crops. The added advantages of a WSN are that it consumes less power and provides more precise output. Implementing

WSNs in agriculture yields high-quality crops and reduces low-quality ones. Instant alerts are sent when trespassers or rodents are in contact with cultivated crops. WSNs reduce the need for frequent human involvement; rather the statistics of the agriculture can be viewed through a smartphone connected to the WSN. Using WSN technology reduces the number of human errors in agriculture.

Figure below shows a typical WSN architecture



Recent trends in information technology

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Software/Application is a digital tool that executes on a computer(laptop or mobile) , which makes day - today life more smoother.

Today information technology has emerged in various ways, e.g. : user aspect, computational aspect.
User aspect : those software developed decades ago were more concentrated on providing a solution digitally than look and feel of it; but as usage increases user's taste on look and feel emerged as well; now aesthetic plays a key role in any kind of the software/application's success; from a development point of view there is a separate technology emitted as UI/UX - front end development; (UI - User Interface, UX - User Experience) front end - what user observes on screen) which takes full responsibility of aesthetic of the software/app irrespective of how software/app works logically. (these provides proper hierarchy for front end development) - those software developed decades ago where User Interface was not a concern are now adopting these technology to enhance User Interface without altering underlying logic.

Computational Aspect : those good old days software/apps, where user need to install them on their computer to make things done, where sometimes computer should be fair enough to install them(RAM, ROM, Processor) example : tally, ms office etc, but as a result of internet usage evolution ; where internet become a basic entity for a human , software/application took a great advantage of it; latest trend is developing software/applications on cloud (cloud - at server space where all calculation/processing part is done and only results will be shown on users screen - RAM, ROM, Processor everything will be utilized from hosted server than from user's computer.)

This drastically reduces dependency on powerful computer to use that software/app at user's end (ex: office 365, gaana, wynk, whatsapp) - this is the main evolution happened where user spends less computational power on his computer and it increases efficiently (space and time) of it; moreover data is safe somewhere on server.

Components of software/application

- User Interface - front end
- Logical calculation - back end
- Database - stores data
- Hosting - making it available on internet

User Interface - how user interacts with software/application
Trending technologies
(Javascript Frameworks)

- Angular
- ReactJs
- VueJs
- Swelt
- Flutter

Logical Calculation -
Backend is a part which does all logical things (data validation , fetching data from DB etc)
Latest Trending technologies

- Hibernate – Java
- Springboot – Java
- Laravel – PHP
- CodeIgniter – PHP
- Symphony – PHP
- Django – Python
- Flask – python
- Rails - Ruby

Database - stores all data of the software/app
Latest Trending technologies

- MySQL - structured database
- PostgreSQL
- MongoDB - document based database
- Maria DB
- Firebase1

Hosting

- AWS - Amazon Web Services
- GCP - Google Cloud Platform
- Microsoft Azure

Information Technology , name itself indicates information is a key here, without an information or data nothing has it own existence; Data has such a role where analysis of these data has its own importance where Machine Learning came into picture, it analyses incoming dataflow and decides by itself what to do with it. Feeding a system those all data which understands what data indicates what and what to be responded for what; it is Artificial Intelligence Making real world entities(door, geyser, car, light) work by them self based on command received through an internet without human intervention ; it is Internet Of Things (IoT) Usage of same codebase for both desktop and mobile is fast growing technology, where development time, debug time will be reduced dramatically and software/application maintenance is much easier; Cordova, PhoneGap, Ionic, React Native, Flutter, Electron, PWA makes all those magic behind the scene...

IoT based healthcare systems and applications

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Healthy Internet of Things (Health-IoT) is an important path to solve medical health problems, and also has an important realistic meaning for promoting the development of the medical health industry and improving people's quality of life. Compared with the traditional things-centered IoT, the Health-IoT is “human-centered”, and all network accesses, data analyses and services are conducted surrounding humans; the sensor at the data collection layer is not a common sensor, but a human body sensor for collecting physiological health parameters, and network accesses, data analyses and services are all conducted based on the “human-centered” idea.

The previous Health-IoT emphasized the design of a human body sensor and the collection of human body physiological data, but did not fully consider the users' mobility. Therefore, it is inconvenient to use in daily life and may even adversely affect daily life. The development of the mobile internet brings the integration of physical world, virtual world, and social network, thus generating Cyber-Physical Society Systems (CPSS). Integrating the Health-IoT into CPSS, allows users to obtain the services and convenience brought by mobile health and mobile medical treatment, while users are under highly mobile conditions in the physical world and the social network space is an inevitable trend for development of Health-IoT.

Traditional IoT has been widely applied in the traffic, logistics and retail industries. With its maturity, the IoT attracts people's attention in the field of healthcare. However, lots of applications, which promote health services to families or individuals by utilizing IoT technology, later were proven to be unsuccessful. Due to its importance to improve medical treatment quality and service efficiency, the Health-IoT is a milestone in health information development. It will play an important role in improving people's health levels and enhancing their quality of life.

Augmented reality and virtual reality (AR & VR)

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Augmented Reality (AR) involves a real environment with the addition of digital elements. Users can engage in AR-based applications with their smartphones or smart glasses. The digital content can be added onto a live camera feed and made to look as if it is part of the physical world. AR technology can be applied to healthcare, education, tourism, navigation systems, entertainment, and many others.

Virtual Reality is the use of computer technology to create a simulation environment. VR places the user inside an artificial experience. Users are completely immersed in the synthetic 3D experience and can interact with it using devices, such as special goggles with a screen or gloves fitted with sensors. VR technology can be applied to advanced fields of medicine, engineering, education, design, training, entertainment, and many others. The most important piece of a virtual reality kit is the headset. The higher quality headsets need to be connected to a computer to run apps and games. AR, VR, and MR can be augmented with machine learning and artificial intelligence (AI). This has been somewhat basic over the past few years, although it's expected that these will become increasingly sophisticated over the coming years. A shopper can walk around the store and have their questions answered by an NLP chatbot while having AI recommendations for new products based on their previous purchase history. Education is one of the most promising sectors that is now running in VR. As innovation and change affect all areas of life, teaching and learning skills have also increased effectively per the new technologies. Virtual Reality continues to establish itself as a good asset in an education system. Its success suggests people remember more about something through direct experience rather than reading, seeing, or hearing about it. There is also some evidence that those who explore more of the virtual space form deeper cognitive associations with the content.

Automotive: With VR technologies, engineers and designers can easily experiment with the look and build of a car before actually spending any money on it. BMW and Land Rover already use VR apps to review design and engineering. By reducing the number of prototypes built per vehicle, VR is helping the automotive industry save millions. Defense: VR is also ideal for the defense sector. It can provide military personnel and defence contractors a way to gain valuable experience of dangerous or life-threatening environments from the safety of the training room. Real Estate: VR can guide a client through a real estate portfolio with a virtual experience of touring real-life properties. Virtual and Augmented Reality offer experiences like no other, allowing people to conceptualize and understand ideas that would be difficult to imagine using only a picture or a detailed description.

Healthcare is one of the biggest adopters of VR, with trainee practices for robotic surgery, phobia treatment, surgery simulation, and skills training, to name just a few. Many healthcare organizations across the globe have started making use of VR in their operations and have realized its benefits. Some of the key applications of virtual reality in medicine are listed below. Medical Training: VR can be used to provide virtual training for special or emergency situations or for using expensive equipment, as well as to provide students with a medium to learn about the human body without actually working on one. Robotic Surgery: This is a recent innovation in which surgery is performed remotely with robotic devices such as robotic arms controlled by a human surgeon. Virtual Reality in Diagnostics: VR is being used as a powerful diagnostic tool, which helps doctors and physicians get a more accurate diagnosis report. This is done with the help of a combination of methods (such as MRI/CT scans) and eliminates any mistakes, making it a pain-free experience for the patient. Immersive technologies have come a long way and have started gaining acceptance in mainstream markets. With the advancement of mobile technology, AR is now available to everyone without the need for expensive equipment. This paper tries to give an overview of the length and breadth of the ever-expanding immersive technologies and the avenues where these technologies can be used.

Synthetic aperture RADAR

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Over the years several advancement and research work are going on related to remote sensing applications. Synthetic Aperture RADAR (SAR) is one of the newer and advanced remote sensing imaging RADAR. The role of this RADAR is to obtain the images of the earth surface during all seasons. The high-resolution images are obtained through this RADAR. The RADAR can operate and capture the images day and night in all type of weather conditions.

Carl Wiley invented Synthetic Aperture RADAR in the year 1951. During this tenure Carl was working in Good Year Aircraft Company. In Synthetic Aperture RADAR the two platforms that is sensor and target region both are in relative motion. Till date several design improvements have been done on this RADAR, basically on data processing units. The bands of operation of SAR are L, X, P, S and C band. The polarization modes are known to be dual and quad polarization.

There are basically two types of RADARs. The first one being airborne RADAR and second one is space borne RADAR. The SAR processing unit is mounted on a moving system basically aircraft or space craft. The target is covered by single beam by the RADAR antenna. The target area is continuously illuminated with group of pulse of radio waves, at wave lengths meters to mm. In response to incident wave the various echo waveforms are received by the receiving antenna. At several different antenna positions, the target is detected with coherency. This obtained data is first stored and processed further to get the features of elements in an image of acquired target region. The target areas are snow, soil, forest, ice, sea, vegetation and urban. The data is categorized as Polarimetric Synthetic Aperture data, Interferometric Synthetic Aperture RADAR data and Polarimetric-Interferometric synthetic aperture RADAR data.

The satellites of operation are RISAT1- ISRO India, TanDEM-X DLR/Germany, SRTM NASA, USA and airborne synthetic aperture RADAR sensors AIRSAR-NASA, Pi SAR –JAXA Japan, C/ X SAR-CCRS/Canada are few of them. The various fields of applications related to SAR are Agriculture, Oceanography, Forestry and Geology to name few.

Space borne SAR: RISAT1- ISRO India

Air borne SAR: AIRSAR-NASA

Semiconductor - the future of India

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Some call it the 'brain' of modern electronics, while others call it the 'heart.' Regardless of the description, semiconductor chips play a critical part in making life easier, stimulating digital disruption, and advancing the economy. For something that the entire world relies on, the semiconductor manufacturing ecosystem is surprisingly constrained, with only a few countries capable of designing or manufacturing them across the world. The field of semiconductor technology is progressing at a very swift pace, according to experts, and is emerging as a major area of the digital economy. With a worldwide shortage of semiconductors, and projected huge demand from speeded up digitalization since the COVID-19 pandemic, together with the advent of new technologies from autonomous vehicles and 5G telecommunications to artificial intelligence (AI)-driven technologies, government and universities in India are stepping up courses specializing in semiconductors.

What in for Students?

Student interest in electronics engineering is high, but very often graduates must be content with a limited choice of employers related to their core subject. The situation is likely to change, after recent government policy measures in the electronics and semiconductor field including the decision to set up a fabrication plant (fab). Among them, the National Policy on Electronics (NPE), recently approved by the government, aims to achieve a turnover in electronic system design and manufacturing (ESDM) of about $400 billion by 2020 involving an investment of about $100 billion.

So, what are the job prospects for electronics graduate in the field of semiconductor design? There are plenty of jobs, mostly in multinational companies (MNCs) operating in India. There are over 750 MNC captive centers in India, with 350 in the Engineering R&D space. With many semiconductor research centers in IITs, NITs and many premier institutes students have a bright chance in playing a great role in India's digital economy by stepping into the semiconductor Industry. These centers provide an opportunity to do cutting-edge design. However, so far, those who specialized in semiconductor materials and device fabrication usually had to leave the country for jobs or higher studies. The recent move by the government to open a fab will certainly led to opportunities for students in these areas. Recently the government unveiled a ₹76,000-crore package for the development of India's semiconductor and display manufacturing ecosystem, including ₹2.3 lakh crore in incentives to position India as a global hub for electronics manufacturing, with semiconductors serving as the foundational building block. According to government estimates, the Indian semiconductor market was worth ₹1.13 trillion in 2020 and is expected to touch ₹4.73 trillion by 2026.

The bottom line is that it is evident that India has the ability to design & manufacture its own semiconductors and establish an end-to-end supply chain within the country itself. India already has the right atmosphere, which followed by strategic implementation of resources and government support, might be a game-changer for the country. Semiconductors helped usher in the Digital Age in the 20th century, and presently the Information Age. Now they are transforming the lighting, energy, and biotech markets. A great opportunity lies for all the engineers across India to board this semiconductor bus.

Era of predictive maintenance

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Predictive maintenance is a method that uses data analysis tools and techniques to detect anomalies in your operation and possible defects in equipment and processes so we can fix them before they result in failure.

WHY PREDICTIVE MAINTENANCE?

- Minimizing the time of the equipment that is being maintained.
- Minimizing the production hours lost to maintenance.
- Minimizing the cost of spare parts and supplies.

Tools for predictive maintenance,

- Vibration Monitoring
- Oil Monitoring
- Wear Debris Monitoring
- Thermography
- Non – Destructive Testing

The strong grounds for highlighting the vibration monitoring are due to its immense significance in Predictive maintenance. The majority of faults (80% of faults) in rotating machines can be diagnosed with vibration monitoring where as the other faults stand at 20%. The process followed to over haul the rotating machine with vibration monitoring is Detection, Diagnosis & Prognosis. The two keywords related with vibration monitoring are amplitude and frequencies. Any rotating machine results output in terms of frequency and amplitude, when this amplitude increases beyond the acceptable limits of standards failure occurs. The role of engineers is to keep the centrifugal forces (amplitude) of rotating machines within limits of defined standards. Although there are some disadvantages to predictive maintenance (high start-up costs, the need for specialized skills, the limitations of some equipment), it allows maintenance to be performed only when required, helping facilities cut costs, save time and maximize resources. Consultation with equipment manufacturers and condition monitoring experts should be undertaken before deciding if predictive maintenance is best for particular assets.

Effect of swirl on flame structure

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Combustion plays a vital role in many heating applications in domestic heating or industrial heating application. The controlled combustion, in which heat energy is released by the chemical reaction between the fuel and oxidizer. Industry uses hydrocarbon fuel for combustion purposes. The applications of the flame jet are:

- Metal melting, metal heating, Scrap melting
- Shaping the glass
- Heating the metal bars
- Soldering, brazing, cutting and welding
- Water heaters, domestic gas stoves
- Steam generation plants
- Dismantling of underwater structures

The flame jet is produced by the following types of burners for the particular applications.

1. Diffusion flame burner
2. Coaxial tube burner
3. Premixed tube burner

Due to better combustion characteristics, swirling flames are becoming important in practical applications. Several researchers studied on premixed swirling flames and diffusion swirling flames. To investigate the effect of swirl, the inverse diffusion flame behavior is studied for the different operating parameters.

Flame behavior:

The free flame shapes of IDF burner for varying Reynolds number (Re_a) and equivalence ratio (ϕ) is shown in figure 1 and 2, respectively for with and without swirl. The buoyancy-controlled orange/yellow colour flickering flame is observed for without swirl condition and indicates improper mixing and incomplete combustion. These yellow flames represent the soot formation in the flame. When a swirl in the flame is provided, complete combustion with a shorter flame is observed. The IDF with swirl represents the base flame, neck region, where air-fuel mixing takes place, and the post combustion zone. The twisted tape results in an enhanced mixing of air-fuel and splits the inner reaction cone formed in the post combustion zone of flame.

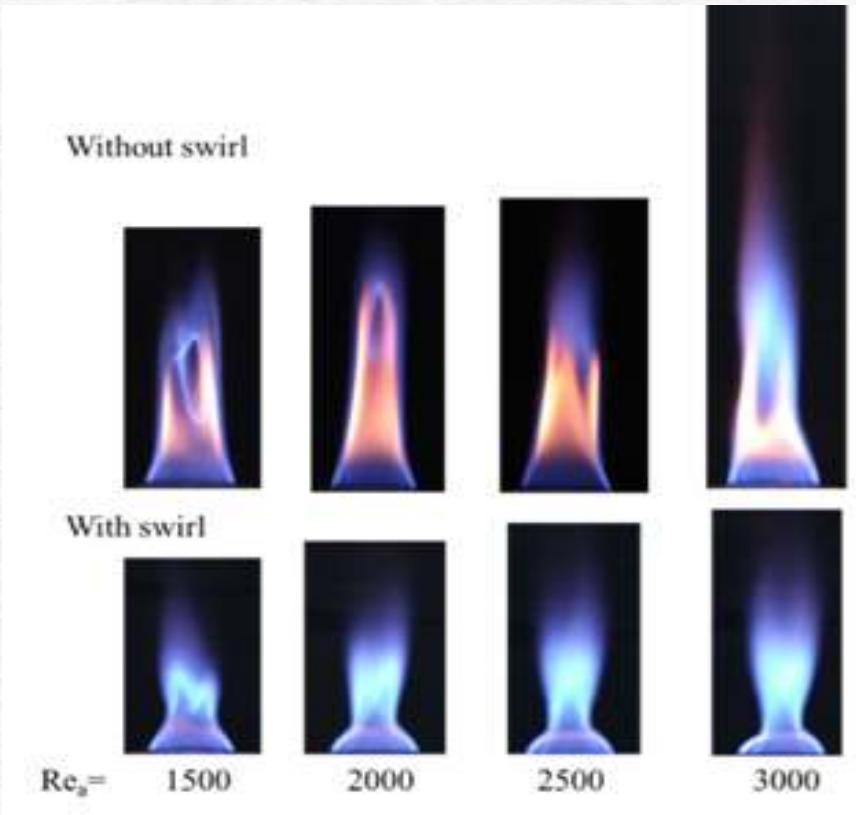

Figure 1. Free flame shapes for varying Re_a and at Ø=1.1.

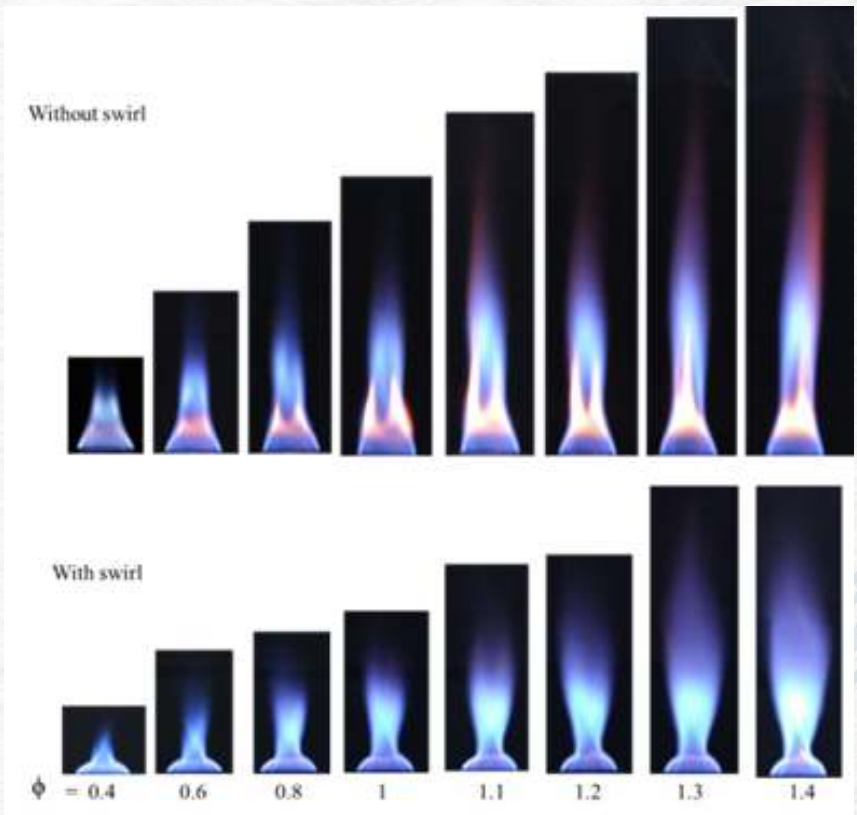

Figure 2. Free flame shapes for varying Ø and at Re_a= 3000.

Effective use of digitalization in civil engineering

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The digital revolution or the evolution of digital technology, began around eight decades ago, precisely in the late 1950s and 1970s. The technological development from the analogous mechanical nature to the digital environment enhanced the late centuries to become a footstool to this era of technologies. Everything that we observe today is from technology, as this is an integral part of all the future industries. The innovations and adaptation of new technologies are the main markets of survival in any field of environment. Cloud computing, data analytics, artificial intelligence, 3D printing, robotics(automation), and virtual reality offer large-scale opportunities. However, when we talk about the vivid advancement of digital technologies, there forms a question of the utilization of these technologies. Digitalization has opened the doors to business, revenue departments, and also in the field of engineering. The effective use of the digital technology can be possible when we realize the objectives of the digital transformation, which is to

- Optimize the process, in other words, a gateway for continuous improvement of operating models that can improve service and internal collaboration
- Increase in efficiency, which would accelerate the workflow and Time management.
- The need for organizational agility provides a constant up-gradation and flexibility for business innovations and research.
- Reduction in cost and improvement in the performance of scientists and employers where productivity is the main adaptation of innovation.

These objectives lead to the effective utilization of digital technology. The digitalization in the field of medicine is shaping the future of primary health that involves digitalized treatment of disease and monitoring of health care by using computing platforms, software, and sensors (Electronic health records of patients, (IoT and medicine, VR and AR (Virtual reality and augmented reality)) for surgical training and practice). The integration of data and simulation, 3D modelling and printing, Robotics, etc. The field of engineering crafts advancement it can be Drones, Remote sensing information regarding oceans and land conversation, control and prevention of air and water pollution, Green and sustainable buildings, and many more. The era of digitalization and its effectiveness has also impacted the new military technologies where artificial intelligence, biotechnology, and hypersonic aid in providing high-resolution data of environments like terrain information and communications advancement of weapons and gadgets. Digitalization can reshape the economy, growth of private sectors, government sectors, education systems, research institutes, and every aspect related to modernization.

There are limitations to this fast up-gradation also, as the power of usage depends on each individual and whether the utilization causes destruction or upgrading for the effective growth of mankind. Can this be a boon or a curse? This questions the thought of privacy as digitalization hinders the right to privacy when the data could be misused. Hence the need for the effective use of digitization is one of the prime concerns. Every day is a new innovation or research which is discovered and upgraded, and without technology, a day cannot be imagined. Based on the current times, there will be advancements and research, as humans should adapt to the change and learn the effectiveness of each innovation and technology. For growth and reshaping the future, digitalization is a key of all means.

Impact of digitization in modern life

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This is the 20th Century and many inventions have been made to improve the social life of the modern generation .Now days man is so busy that he does not have time to look into his daily affairs. So, the science has been developed to minimize his daily routine life activities. So, to get done the work without any more efforts and putting the time to get done the work digitization has come in the process. Then, what is digitization? It is the process of conversion at text or sound into a digital form that can be processed by a computer. For example, digitization refers to creating a digital representation at physical objects or attribute or instance which scans a paper document and save it as a digital document that is example of pdf. In other words, digitization is about conversion something non digital into digital representation or artifact.

Digitization is a process of converting information from the normal format into digital format. This format presents data that is bits or bytes. Digitization of business helps into the efficiency of its process consistency and quality. Business leaders worldwide increasingly are warming up to technological solutions that can streamline their operations and overcome challenges posed by conventional infrastructure and systems. These challenges have to do with outdated protocols, a lack of efficient sensor integration in factories, and current maintenance frameworks, which are starting to prove regressive and counterproductive. A plant needs to adopt four fundamental principles for undergoing a digitally smart makeover, which is perfectly aligned with the Industries 4.0 perspective, 1) Interoperability is pivotal, with machines, sensors, devices, and people connecting and communicating with each other; 2) Information transparency must be achieved through sensor data contextualizing information; 3) Technical assistance by systems is critical in supporting humans with tasks that are too difficult or unsafe; 4) Decentralizing decision-making by empowering cyber-physical systems to make simple decisions and attain a basic level of autonomy. This all perspective helps in making business more effectively digitalize.

The Covid-19 pandemic has led to an inevitable surge in the use of digital technologies due to the social distancing norms and nationwide lockdowns. People and organizations all over the world have had to adjust to new ways of work and life. We explore possible scenarios of the digital surge and the research issues that arise. An increase in digitalization is leading firms and educational institutions to shift to work-from-home. Blockchain technology will become important and will entail research on design and regulations. Gig workers and the gig economy is likely to increase in scale, raising questions of work allocation, collaboration, motivation, and aspects of work overload and presenteeism. Workplace monitoring and technostress issues will become prominent with an increase in digital presence.

As the use of video- and audio-conferencing tools increases significantly, organizations will ramp up their technology infrastructure to account for the surge. This will lead to increased investment in bandwidth expansion, network equipment, and software that leverages cloud services. With employees becoming acclimatized to the idea of work-from-home (WFH), meeting and transacting online, firms will shift to WFH as a norm rather than as an exception. This is being adopted by many firms which have the digital infrastructure in place to handle the required load and bandwidth. Digital transformation technologies such as Cloud, Internet-of-Things (IoT), Blockchain (BC), Artificial Intelligence (AI), and Machine Learning (ML), constitute a bulk of the of what is being adopted by organizations as part of their transformation effort.

Effective use of digitization - current trends

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Digitization is a process which converts any information into a digital format. The result thus obtained may be a digital image or any digital object represented with a series of number that describe a discrete set of samples. A noticeable amount of progress is observed in every field. This change is due to the emerging new digital technologies. For instance, if you want to check your result of any examination, what is the mode you use? Where will you find the results? We obviously will use the digital mode and we will find the results on our university website. This is what digitization is; Electronic signatures(eSign) etc., are some of the examples of digitization. Digitization process is growing at a fast pace where from the simplest data to the Complex one all are being digitized for effective use in the future. We are in a digital age where there is enormous data available every single day and making use of this data companies are turning their business models to upscale their profits. Digitization not only provides us the freedom to access any type of data from anywhere in the world that also provides us an open, free and unrestricted access to digitization. The need for digitization today and in the upcoming days will be too high, whether or not you are from the IT background. Digitization ultimately drives the change, because it impacts not only in the industry structure and strategic positioning but all levels of an organization (every task, activity, process) and it is extended supply chain. Some of the areas where digitization is used effectively are:

1) Transformation in the business organization: Businesses are almost universally undergoing digitization today, but only a small amount of organization has really gone fully digitized to differentiate themselves from their competitors. Organizations are rethinking on what customers value most and based on that creating operating models that take advantage of what's newly possible for competitive differentiation. The proliferation of mobile devices, advance knowledge of consumer behavior powered by analytics and emergence of cloud as also thrown up new opportunities and paved a way to integrate new technologies.
2) Digitization in manufacturing and delivering of products: Digitization also refers to innovation. It not just adds a layer to the business as usual but also gears up to a whole new way of working and staying ahead of curve. Being a digital enterprise is about leveraging the interaction that digital world facilitates.
3) Digitization in Education: From the Gurukuls of old where students gathered outdoors to listen to the teachings of their guru, Indian education has come a long way. Today, several Indian learners learn through education technology at home or work and have an access for the learning material any time. Amidst Covid-19 pandemic, e-learning has accelerated from primary to the university level education.

In this way, there are many advancements and increase in the use of digitization. From developing compact sized chips for manufacturing cars or other products using the AI robots, we have come across a huge amount of advancement. The best part about digitization is it is combined with both, the aspects of online data and offline data. Digitization can be costly, but it also has long-term benefits for implementing innovative solutions. The combined features of digital technologies are expected to fuel a new wave of ground-breaking discoveries.

Effective use of digitization

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Have you ever wondered, how a hand-held cellular phone could revolutionize a human being's life? Have you ever seen a person without any electronic gadgets? Have you thought of life without digitization? Well life could have never been this easy without digitization. Digitization has solved the major problems of our life and has consolidated all the work under a fingertip. Say from ordering a food, booking tickets, paying bills and even till identifying the diseases. The typical meaning of Digitization is converting information into digital format. Digitization and development are two faces of same coin. If you increase digital advancement, you are in a path of developing the better future. The country which has strong digital development is always leading a step ahead in future route way. Digitization is as simple as counting the digit, once a person understands the pillars of digitization, he always develops his entire empire on those pillars. Even a bubble head could understand the dignity and importance of digital market for self-development. It provides social and financial grandeur. Digital life makes livelihood more comfortable and endeavoring. We have seen the covid-19 crisis and we also have seen digitization was only the solution to overcome the crisis. During this crucial period the e-learning has educated and had continued in providing learning assistance to millions of students across the globe. It has even up skilled the employs and helped them to develop in their professional career. It showed people how one can handle work-life balance and was successful in giving moral support to the depressed people.

In the last two years we have seen an expansive growth of digitization. Some used the digital platform to advertise their business and some to showcase their skills to get jobs. In many ways we saw its assistance in building a successful livelihood for many youths. Youths are more liable to new technology and its trends. Digitization filled gap between technology and youth. Digitization has boosted the employment opportunities. The development in new versions of digital world is gradually increasing the employability. Due to this we could see the ray of hope where the poor becoming rich. We could see that the digitization can turn dreams to reality. Nothing is impossible in this world. The right way of using the things and in right quantity always leads success at greater heights. Still the development in this field is going on and one can never foresee the upcoming future world. Digital world keeps us connected with other humans and gives a better version of us. We have learnt and explored ourselves through the whole journey of the crucial process. From toddlers to geriatric have the addiction of digitalization but using it in right way and right quantity will assist our lives to greater extents.

Nevertheless, it has been a part of technology, finance, social, educational, and economic stability of every country. The cultural heritance of various places has been exploited and upheld by the digital world in a very adorable manner, so that one could feel the site and would understand the importance of the place. One can flourish the significance of the culture and could appreciate the cultural richness. All government sectors have transformed themselves into digital attires to make the work easier and to make the process convenient for the people. This reduces the corruption and increases the in-time workflow. Digitization has assisted not only large-scale business but also the farmer in their technological growth. Many companies are trying to find out the effective use of digital integration in increasing crop growth that can help farmers to lead their livelihood in a fruitful manner and that will encourage them to excel in their agricultural sector. As the saying goes “Anything used more than needed will be toxic”, that even applies in the digital world too. A proper use of digital gadgets and in a proper path can get oneself to greater heights. Using digitization in a right manner will always give a positive and generous growth. Lastly as Watter Isaacson said “We're all swimming in this digital revolution that we live in” gives us the thought that we and digital world are correlated.

Smart construction project

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Now, it's a world of digitalisation. Developing India means Digital India. In the area of Civil engineering, the digitalisation of certain projects or practices have been continuously evolving. Among the latest one is "SMART CONSTRUCTION PROJECT". It is an open project with over 20 partners, which includes design software, smart machine sensors, fleet management and survey tools. Smart Construction applications can upload 3D models to earthmoving equipment such as excavators and bulldozers. Automatic machine control ensures that the right contours are followed during the operations. Sensors on the machines automatically provide as-dug data. This reduces the need for minor survey operations, although major works still need to be followed up by a verification survey.

The benefits of using this technology include the utilisation of construction tools and machinery by tracking their locations, improving the quality of construction materials like monitoring the curing process of concrete, and increasing safety on site by detecting when workers are exposed to high noise bad air quality etc. The most challenging aspect of introducing this technology lies in its risk of cyber-attacks and data breaches. However the risk can be minimised by proper safety measures so that the privacy rights of an individual can be protected.

One of the applications of this smart construction project was observed in the United Kingdom, where a technology start-up demonstrated to more than 40 construction sites on how sensors embedded in concrete can be useful for monitoring the curing process and predicting the curing time needed.

Having digitalised the construction field, n number of innovative digital solutions for construction sites have been developed. The operation of such solutions needs skilled labourers/operators, and the continuous training or upgradation of methods needs to be carried out. Hope in the near future, and smart technologies will get better and improve/modify the construction field to greater heights. Well all we can say is "**डिजिटल बनेगा इंडिया तो बढेगा इंडिया**."

Understanding ourselves through spiritual walk

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As William Shakespeare said, “It is not in the stars to hold our destiny but in ourselves”. Our Destiny can be created by helping ourselves: but how do we help ourselves? How do we know what we actually want?

In today's world we are just lost in too many dilemmas of what we actually want! To know what we actually want we should connect to ourselves, and that connection is nothing but spiritually – connecting to our soul, there is no other teacher than our soul.

So, what is spirituality?

- Spirituality is about realizing your peak possibility
- Spirituality is neither a physiological nor a social process – it is 100% existential.
- Spirituality is not a disability – it is a phenomenal empowerment of life.

Did you ever wonder how can spirituality help me who is a student?

Yes, by connecting to ones “inner selves” by knowing what want and walking into that path brings happiness to oneself, no matter you are a student or a professional, facilitates growth in their academic and leadership skills, contributes to their intellectual self-confidence and physiological well-being and enhance their satisfaction with life.

You don't have to withdraw to a mountain cave to turn spiritual. It does not matter where you are and what you do in life. The spiritual process has nothing to do with thw outside world – it is something that happens within you.

Be spiritual and you will be joyful.

Lead a stress free life - not by a drug - rather by the spiritual way

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It is common in today's world to get stressed. Our life has becomes fast, when we wake up, we start preparing to go to the office, Job or Business or Shop. Even children need to be ready for school as soon as they wake up. Time span has become narrow and we do not have time for our family, friends or loved ones. People are living stress ridden lives, be it stress arising from occupations, career, relationships or finance.

We work like a robot and at the end of the day, we end up being tired and not in the mood of talking with family members. As a result, we do not want to go to Job next day from our heart, but we go because we need to. So People Neither perform their duties at Job with 100% dedication, nor they spend time with family which is one of the most important thing. We do not have balanced life at all. Thus people are suffering from various psychosomatic problems because of increasing stress in life. The powerful monster is capable enough to ruin our mental stability along with the physical stamina. Stress invites lots of bad diseases towards us e.g. High blood pressure, Heart-stroke, Diabetes, and many worse diseases.

Let us recall a famous example :

Once a professor told their students to stay up the hand with holding a stone in it. They were able to do it easily for a couple of minutes. But eventually, they found difficulties to keep their hands up. Later it was so difficult that every student gave up and put their hands down. The weight of stone was never increased, then why they failed to keep it up? The same logic goes for our thoughts. If we are worried about something, we started thinking over it. But when we overthink or we do not stop ourselves from continuous thinking over it, it becomes a burden for us. Our mental stability gets disturbed due to it.

But why we do this? Because human mind tends to keep in control everything. It always thinks about the result. We always want to control it. And if we got what we want, most of the time we became very proud of it. The achievements you earn is not something that you need to be proud of, it is something that you need to forget.

Perhaps I can correlate to one of the shloka in Bhagavad Geeta

Bhagavad Geeta : 2: 62, 63: “While Contemplating The Objects Of Senses (People, Money, Power, Etc.) A Person Develops (Excessive) Attachment For Them, And From Such Attachment Selfish Desire Develops, And From It Arises Anger (Perhaps Out Of Frustration). From Anger Arises Delusion (Grandiosity, Paranoia), And From Delusion Bewilderment Of Memory (Cognitive Functions Deteriorate). When Memory Is Bewildered, Intelligence (Wisdom) Is Lost (We Begin To Make Stupid Mistakes). When This Happens, One Falls Into Degradation (One Becomes Totally Stressed-Out).”

If you look at the life of Krishna, you will able to see that he always had followed that rule “Perform your duties, but not to be attached to the desire of the results. You have right to perform, but you do not have right to control the results”.

कर्मण्यवाधिकारस्ते मा फलेषु कदाचन ।
मा कर्मफलहेतुर्भूर्मा ते सङ्गोऽस्त्वकर्मणि ।। २.४७।।

That is why sometimes losing some wars did not make him go disappointed and did not degrade him as an ultimate warrior. That is why it did not make him proud on winning the wars.

Free your minds with all the barriers and expectation and do the work you need to do fearlessly. Whatever will be the outcome, it doesn't matter. But how you do your job matters the most. Whenever Krishna did something, he did it with 100% involvement. Didn't matter he love or he fights or he educate or he dance, whatever he did, he did with 100% involvement. Because he had 100% rights over his performance. But he did not owe anything from the result.

To Summarise, Spirituality has a major role to play in everyone's life, often people misunderstand by connecting spirituality with God ,religion etc , I See spirituality as simply being connected with one's inner child , spirit or soul and doing the self-enquiry , This actually disconnects us from our external world and helps us to experience the peace, calmness, relax , and rejuvenate .

All external situations happening around cannot be under our control always and we try to gain control over circumstance on which we do have control ,before doing this ,can we contemplate on the situation , by asking

- Is this really important for me?
- Should I react ?
- What happens if don't react ?
- What will happen if I react ?
- Have I Performed my duty with 100% dedication ?

The answers are right there and when the situation occurs we don't pause to check and just react to the situation, which most of the times leads to the Mental and physical imbalance , if the results are not according to our expectations .

Keeping a strict Routine and at least 1hr /day aside for one self ,apart from our daily activities is very important, and I have seen Meditation has helped me and many others in my contacts to regain their mental balance and physical health .

It is possible that sometimes it is very difficult to control the thoughts in your mind. I suggest doing Meditation daily at least 10 Minutes every day. In the beginning, when you will meditate, lots of thoughts will pop up in your head and even keeping your eyes closed will become very difficult for you, and here is the trap we fall into, often we tend to get carried with chain of thoughts and get lost, so, Be aware, allow the thoughts to come and go , do not get attached with the thoughts, Afterall it's just a thought , it has no significance until you give it a importance, so just hold the breath as your anchor start the practice, if possible, get a training from some learned master, I wish you all ,A Very good luck for your stress free and healthy life.

Influence of spirituality in our daily life

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"There is no other spiritual teacher than our own soul" - Swami Vivekananda
"Spirituality is not about become special, it is about becoming one with everything" - Sadhguru
Spirituality is a broad concept. In general, it includes a sense of connection to something bigger than us, & it typically involves a search for meaning in life.

Spiritual questions: what indicates that we are in search of Spirituality?

We might experience asking the below questions to ourselves in our life at some point of time: Am I a good person? What is the meaning of my suffering? What is my connection to the world around me? Do things happen for a reason? How can I live my life in the best way possible?

How does spirituality impact our daily life?

Helps to find purpose and meaning: Exploring spirituality can help us find answers to questions we have about philosophical questions such as "what is the meaning of life?" and "what purpose does my life serve?" Helps to cope with feelings of stress, depression, and anxiety: Spiritual experiences can be helpful when coping with the stresses of life.

Restores hope and optimism: Spirituality can help us develop a more hopeful outlook on life. Helps to find a sense of community and support: Because spiritual traditions often involve organized religions or groups, becoming a part of such a group can serve as an important source of social support.

How to start or practice Spirituality:

- Pay attention to how we are feeling: Part of embracing spirituality means also embracing what it means to be human, both the good and the bad.
- Focus on others: Opening our heart, feeling empathy, and helping others are important aspects of spirituality.
- Meditate: Try spending 10 to 15 minutes each morning engaged in some form of meditation.
- Practice gratitude: Start a gratitude journal and record what we are grateful for each day. This can be a great reminder of what is most important to us and what brings us the greatest happiness.
- Try mindfulness: By becoming more mindful, we can become more aware and appreciative of the present. Mindfulness encourages us to be less judgmental (about us and others) and focus more on the present moment rather than dwelling on the past or future. From my experience, I would like to say that if coffee is our life, Spirituality is the Cup which holds the life(worldly). During the recent pandemic (COVID 19), practice of spirituality has gained momentum and helped millions of people around the world. We all are distracted by many things around us. Hence Spirituality is the need of hour.
- Conclusion : Spirituality can enrich our life and lead to several benefits, but it is important to be cautious to not let spiritual ideals lead to pitfalls such as dogmatism or a reason to ignore the needs of others.

(Source: Own experience and publicly available)

ನಿವೃತ್ತಿಯ ಬದುಕು ಹೀಗೆಯೇ....

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ಒಮ್ಮೆ ಕೆಲಸದಿಂದ ನಿವೃತ್ತಿಯಾಗಿ ಹೋದಮೇಲೆ ಮತ್ತೆ ಕಾರ್ಯಾಲಯಕ್ಕೆ ಕೆಲಸ ನಿಮಿತ್ತ ಹೋದರೆ ಸೇವೆ ನೀಡುವಾಗ ತಮ್ಮ ನಿವೃತ್ತರನ್ನು ನಿರೀಕ್ಷಿಸಲಾಗುತ್ತದೆ.

ಇದ್ಯಾವ ಪೀಡೆ ಬಂದು ಕಾಟ ಕೊಡುತ್ತಾ ಇದೆ ಎಂದು ಗೊಣಗುತ್ತಾರೆ. ಹೊಸಬರಾದರೆ ಏನೋ ಒಂದು ಸುಳ್ಳು ಹೇಳಿ ಕಳುಹಿಸುತ್ತಾರೆ, ಆದರೆ ನಿವೃತ್ತರಿಗೆ ಹಾಗೆ ಮಾಡಲು ಅವರಿಗೆ ಆಗುವುದಿಲ್ಲ. ಸೌಜನ್ಯದಿಂದ ಮಾತನಾಡಿಸುವುದಿಲ್ಲ, ಗೌರವವನ್ನು ನೀಡುವುದಿಲ್ಲ ಸಂಪೂರ್ಣ ನಿರ್ಲಕ್ಷ ಮಾಡುತ್ತಾರೆ. ಕೆಲವೊಮ್ಮೆ ತುಂಬಾ ನೋವಾಗುತ್ತದೆ, ಸಿಟ್ಟು ಬರುತ್ತದೆ.
ಆಗ ಅತ್ತೆಗೆ ಬಂದ ಕಾಲ, ಈಗ ಸೊಸೆಗೂ ಬಂದಂತಾಗಿದೆ.

ಅದಕ್ಕೆ ನಮ್ಮ ಹಿರಿಯ ನಿವೃತ್ತರು ಹೇಳುತ್ತಾರೆ -ರಿಟೈರ್ ಆದ ಮೇಲೆ ನಿಮ್ಮ ಕಾರ್ಯಾಲಯಕ್ಕೆ ಹೋಗಬ್ಯಾಡ್ರಪ್ಪಾ...ಅಲ್ಲಿ ಅವಮಾನ ಪಡಬ್ಯಾಡ್ರಪ್ಪಾ..., ಪಿಂಚಣಿ ವಿಷಯಕ್ಕೆ ಮಾತ್ರ ಹೋಗಿಬನ್ನಿ ಎನ್ನುತ್ತಾರೆ. ಅವರ ಸಲಹೆ ಸರಿ ಇದೆ. ನೆಟ್ ಬ್ಯಾಂಕಿಂಗ್ ಪಡೆಯಿರಿ, ಎಟಿಎಂ ಬಳಸಿ, ಯುಪಿಐ ಪೇಮೆಂಟ್ ಬ್ಯಾಂಕ್ ಉಪಯೋಗಿಸಿ, ಎಸ್ಬಿಐ ಯೂನೋ ಬಳಸಿ, ಆನ್ಲೈನ್ನಲ್ಲಿ ಜೀವಂತ ಪ್ರಮಾಣಪತ್ರ ಕಳುಹಿಸಿ. ಇ-ಮೇಲ್ ಕಳುಹಿಸಿ, ಫೋನು ಮಾಡಿ. ಇತ್ತೀಚೆಗೆ ನೌಕರರು, ಅಧಿಕಾರಿಗಳು ಆಗಾಗ ಬದಲಾಗುತ್ತಿರುತ್ತಾರೆ ಹೊಸಬರು ಬರುತ್ತಾರೆ. ನೀವು ಹಿಂದೆ ದೊಡ್ಡ ಆಫೀಸರ್ ಅಥವಾ ಬಾಸ್ ಆಗಿದ್ದರೂ ಅಷ್ಟೆ. ಅದು ಈಗ ನಿಮ್ಮ ಆಫೀಸ್ ಅಲ್ಲ. ನಿಮ್ಮ ಕಾಲ ಮುಗಿಯಿತು ಹತಾಶೆಯಿಂದ ಕೋಪಗೊಳ್ಳಬೇಡಿ.

ಇನ್ನು ಮನೆಯಲ್ಲಿ.... ಅಲ್ಲೂ ಹಾಗೇ.... ನಿವೃತ್ತಿಯಾದ ಮೇಲೆ, ದುಡಿಮೆ ನಿಂತ ಮೇಲೆ... ಹೆಂಡತಿ ನಿರ್ಲಕ್ಷಿಸುತ್ತಾಳೆ, ಮಗ ನಿರ್ಲಕ್ಷಿಸುತ್ತಾನೆ, ಸೊಸೆ ನಿರ್ಲಕ್ಷಿಸುತ್ತಾಳೆ, ಅಳಿಯ ನಿರ್ಲಕ್ಷಿಸುತ್ತಾನೆ, ಹಳೆಯ ಫ್ರೆಂಡ್ಸೇ ಗತಿ.

ಗಮನಿಸಿ: ನಿಮ್ಮಲ್ಲಿರುವ ಊರಿನ ಒಂದು ಸಣ್ಣ canteenನಲ್ಲಿ ಕಾಫೀ ಚೆನ್ನಾಗಿರುತ್ತೆ. ಆದರೆ ಬೆಳಗ್ಗೆ ೭:೩೦ ಸಮಯದಲ್ಲಿ ನಿವೃತ್ತರೇ ಹೆಚ್ಚು ತುಂಬಿರುತ್ತಾರೆ, ಯಾಕೆ ಹೀಗೆ....? ಕ್ಯಾಂಟೀನ್ ಮಾಲೀಕ ಗೌರವದಿಂದ ಮಾತನಾಡಿಸುತ್ತಾನೆ, ಮುಂಜಾನೆ ಕೇರ್ ತೆಗೆದುಕೊಳ್ಳುವವನು ಅವನೇ... ಸಿಂಗಲ್ ಇಡ್ಲಿ, ಸಿಂಗಲ್ ವಡೆ, ಸಿಂಗಲ್ ಪೂರಿ, ಅರ್ಧ ಕಾಫೀ ಸೇವಿಸಿದರೆ ಏನೋ ಸಮಾಧಾನ, ಅಲ್ಲಿರುವ ಹಳೆಯ ಸ್ನೇಹಿತರೋಡನೆ ಹಳೆಯ ನೆನಪು ಮಾತನಾಡಿದರೆ ಏನೋ ಖುಷಿ. ಅವರಲ್ಲಿ ಬಹುತೇಕರು ಸಕ್ಕರೆ ಖಾಯಿಲೆ ಇರುವವರು. ಮನೆಯಲ್ಲಿ ಬೇಗ ಮಾಡಿ ಕೊಡುವವರಿಲ್ಲ, ಹೆಂಡತಿ ತನ್ನಂತೆ ವಯಸ್ಸಾಗಿರುತ್ತಾಳೆ.. ಸೊಸೆ ಇದ್ದರೆ ಹೇಳುವಂತಿಲ್ಲ, ಕೇಳುವಂತಿಲ್ಲ. ಮೆತ್ತಗೆ ಕೇಳಬೇಕು. ಮಗಳ ಮನೆಯಲ್ಲಿ ಮುಜಗರ. ಹಿಂದೆ ಹೆಂಡತಿಗೆ ದಬಾಯಿಸುವಂತೆ ಈಗ ಯಾರನ್ನು ದಬಾಯಿಸುವಂತಿಲ್ಲ. ಮಗನಿಂದ/ಮಗಳಿಂದ ಆದೇಶ ಬರುತ್ತದೆ.

ವಯಸ್ಸು ಆಗುತ್ತಾ ಆಗುತ್ತಾ ಇದ್ದಂತೆ ನಮ್ಮ ಕೈಯಲ್ಲಿ ಏನೂ ಆಗುವುದಿಲ್ಲ, ಏನೂ ಮಾಡಲಾಗುವುದಿಲ್ಲ. ಕೋಪ, ಸಿಟ್ಟು ಮಾಡಿಕೊಂಡರೆ ನಮಗೇ ಕಷ್ಟ, ನಮ್ಮ ಆರೋಗ್ಯವೇ ಹಾಳಾಗುತ್ತದೆ. ವಯಸ್ಸು ಜಾರುತ್ತಿದೆ, ಆರೇಳು ದಶಕಗಳ ಹಿಂದೆ ಎಳೆಯದಾಗಿದ್ದ ದೇಹ ಮುಪ್ಪಾಗಿದೆ. ಹೆಚ್ಚು ಊಟ ಮಾಡಲಾಗುವುದಿಲ್ಲ, ದೇಹ ಕೃಶವಾಗುತ್ತಿದೆ, ಮರೆವು ಜಾಸ್ತಿಯಾಗಿದೆ, ದನಿ ನಡುಗುತ್ತಿದೆ, ಕಣ್ಣು ಮಂಜಾಗುತ್ತಿವೆ, ಕಿವಿ ಕೆಪ್ಪಾಗುತ್ತಿದೆ, ಹಲ್ಲು ಉದುರುತ್ತಿವೆ, ಚರ್ಮ ಸುಕ್ಕಾಗುತ್ತಿದೆ, ಖಾಯಿಲೆಗಳು ಅವರಿಸಿವೆ. ಕೈಕಾಲು ಅದುರುತ್ತಿದೆ, ಮೊದಲಿನ ಶಕ್ತಿ ಇಲ್ಲ, ಚೈತನ್ಯವಿಲ್ಲ. ಬಡವನ ಕೋಪ ದವಡೆಗೆ ಮೂಲ.

ವಯಸ್ಸಾದ ನಿಮ್ಮ ಸಂಗಾತಿಗೆ ಸಣ್ಣ ಪುಟ್ಟ ಕೆಲಸದಲ್ಲಿ ನೆರವಾಗಿ, ನಿಮಗಾಗಿ ದುಡಿದೂ ದುಡಿದೂ ಆಯಾಸಗೊಂಡಿರುವ ಆಕೆಯೊಡನೆ ಎಂದೂ ಈ ವಯಸ್ಸಿನಲ್ಲಿ ಜಗಳ ಆಡಬೇಡಿ. ತಾಳ್ಮೆಯಿಂದ ಬದುಕುಬೇಕು ಏನೇ ಬರಲಿ, ಎಲ್ಲವನ್ನು ಮರೆತು ಆನಂದದಿಂದ ಬಾಳಬೇಕು.

Education - light of life

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Education gives you that vision where you can see the thin line between your desire to do something& your patience to hold something for the sake of others. Education leads you to that path where you can identify the reason for your existence and where you can become a reason for others whether they should choose or not to choose your selected path.

Education offers you that power where you can know when there is a requirement to standup for yourself and where you can raise your voice. Education bestows you that willingness where you can try one more time for your unfulfilled dreams & let those dreams tell you why you have carried the so far. Education grants you that environment where you can feel your freedom which was somewhere hidden & feel that worth which you use to forget many times.

Education improvises your that inner beauty which will always be noticed by others even though they try to neglect it & that stamina which will push you in times when you plan to give up. Education shows you that reality which you will never feel by your own when in comfort zone & which you will never adapt if the same gets noticed by others. Education pushes you towards that struggle which will test your patience if you have a strong desire & will challenge you every time while you move towards your goal in order to make you strong. Education grants the power to motivate others and greets you with that confidence which you need to keep it with you always for your betterment & also required to share it with others if one is lacking the same.

Influence of spirituality in daily life

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What does spirituality mean?

Does that mean just believing in god or any tradition and ritual!! Absolutely not. Spirituality is becoming available to the life process in its fullest possibility. And the roadmap to achieve it will be hidden in the believes, traditions etc. Spirituality is the broad concept of a belief in something beyond the self. It may involve religious traditions focusing on the belief in a higher power, but it can also involve a holistic belief in an individual connection to others and to the world as a whole. Spirituality is your belief or sense of purpose and meaning. It is what gives you a sense of value or worth in your life.

Spirituality influences many decisions that people make. It encourages people to have better relationships with themselves, others, and the unknown. Spirituality can help you deal with stress by giving you a sense of peace, purpose, and forgiveness. It often becomes more important in times of emotional stress or illness. You may feel a higher sense of purpose, peace, hope, and meaning. You may experience better confidence, self-esteem, and self-control. It can help you make sense of your experiences in life. When unwell, it can help you feel inner strength and result in faster recovery. Those in a spiritual community may have more support. You may work at better relationships with yourself and others. Education is one that is mostly concerned with mental maturity. It helps to behave sensibly and in a responsible manner. Education grooms a person's behaviour and thoughts. Spirituality in education adds up to this. They tend to be disciplined, respect parents, teachers and also believe in humanity. They also will be dedicated to their studies, research, and jobs.

It removes the fear of death and other insecurities. It also helps to overcome attachment to this world and life related issues. Hence, he loses fear, anxiety and is ready to face failure and consequences in life. The impact of spiritual well being on decision-making is evident. Spirituality is a key component of overall well being and it assumes multi-dimensional and unique functions. Individualised care that promotes engagement in decision making and considers patients' spiritual needs is essential for promoting patient empowerment, autonomy and dignity. More over it makes the human humble.

Implications of spirituality

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As spiritual people, we are happier, healthier, have better perspectives and are more enlighted. There are a number of reasons why spirituality is important to many people around the world. It gives meaning to life, Hope to the hopeless.

It relates and inspires peace. It aids in Make better choices. It adds to happiness and to the contentment. It lessons fear of death. It brings people together. It gives meaning to life knowing the meaning to life is one of the main reasons why spirituality is important to most people.

It having faith in Something greater than yourself tends to give you confidence in a hopeless situation. Spiritual customs and teachings help people heal from sustained Pain & hurt. Religious fellowship with others is normally established from having the same faith or philosophies.

Spirituality, however, can join different people with different outlooks on life into one place. Meditation typically relates to the training the mind to relax and the spirit to develop the compassion, forgiveness, or serenity.

Spiritual influence on education

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This article defines spirituality and relates the importance and influence of spirituality on ones daily life. There are many ways to experience spirituality and the benefits of a spiritual experience.

Many are experienced through organizational or non-organizational religious activities. Spirituality is an underlying human aspect which connects people with themselves, each other, the natural world. It seeks answers to the questions: Who am I? Where am I going? Where have I come from? However on the other side of spirituality it is important to be cautious to not let spiritual ideals lead to pitfalls such as dogmatism or a reason to ignore the needs of others.

Spirituality and its influence

Spirituality is the broad concept of a belief in something beyond the self. The idea of spirituality means different things for different people. The lack of a clear definition of spirituality is one of the issues I will be addressing in this article. The variety of spiritual beliefs and customs are as varied as the people who practice them. It offers a world view that suggests there is more to life than just what people experience on a sensory and physical level. Spirituality involves the recognition of a feeling or sense or belief that there is something greater than myself, something more to being human.

The word 'spirit' in the dictionary addresses the 'life principle', 'the thinking, motivating, and feeling part,' or the 'life, will, consciousness, and thought'. The English word 'spirit' is derived from the Latin word 'spiritus' which means 'breath' or 'air'.

When people think about spirituality they confuse spiritual with religious, but spirituality is more than a religious belief. Spirituality is a larger concept that deals with meaning, purpose and direction in life.

Spirituality influences many decisions that people make. It encourages people to have better relationships with themselves, others, and the unknown. Spirituality can help you deal with stress by giving you a sense of peace, purpose, and forgiveness. It often becomes more important in times of emotional stress or illness. When unwell, it can help you feel inner strength and result in faster recovery. Many people with a mental illness get a sense of hope by talking with a religious or spiritual leader.

One potential pitfall of spirituality is a phenomenon known as spiritual bypassing. This involves a tendency to use spirituality as a way to avoid or sidestep problems, emotions, or conflicts. For example, rather than apologizing for some type of emotional wound you have caused someone, you might bypass the problem by simply excusing it and saying that "everything happens for a reason" or suggesting that the other person just needs to "focus on the positive."

I strongly believe that everyone should search for their spiritual heart and find a way for its strength. Spiritual education must be available to children and adolescents within school or communities for gaining virtues. As we don't have such education system, many parents are turning towards many organizations which inject spiritual virtues into their children's life. I was introduced to such an organization called Sri Sathya Sai International Organization(SSSIO) which conducts Balvikas classes. I personally experienced positive impacts of spirituality on my life with the help of this organization. Such education and relation is the best way to have a peaceful and happy world.

Understanding oneness through spirituality

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Spirituality is truth, sacrifice and surrender. It releases from the clutches of death and give peace and calmness. Teaches the never ending ever existing eternal life spirit when one becomes egoless innocent. It is all about Sacrifice and surrender to God within. By this one can remain happy forever in any kind of situation. It suggests that there is something greater that connects all human beings to each other and to the universe itself. It also proposes that there is ongoing existence after death and strives to answer questions about the meaning of life, how people are connected to each other, truths about the universe, and other mysteries of human existence. The spiritual journey is the unlearning of fear and the acceptance of love.

Does spirituality matter in life? Yes, it does.

It explains the actual purpose of life for the person. If one is confused about why he or she is born, spiritual life can give them the answers. It promotes peace and harmony among people. It minimizes violence, aggression, and struggles. It encourages acceptance, forgiveness which help everyone to live together in harmony. It gives better health as it tells when to eat, how to eat and keeps thoughts good.

Even in the case of sickness, spiritual strength helps in recovery. It wades off fear and helps in keeping the mind composed on positive thoughts roll in. This minimizes depression and helps in faster healing. It encourages us to show love and care for everyone around, including the environment. So, you notice a spiritually enlightened person is less harsh to the environment. The person who follows spirituality shows love and affection to all.

Spirituality enhances work ethics and works quality as the person intends for the service and betterment of others through his work. Spirituality is a very personal experience, and everyone's spiritual path may be unique. Some things we all can do to start exploring spirituality is, paying attention to how you are feeling, opening your heart, feeling empathy, and helping others are important aspects of spirituality. We should start spending at least 10 to 15 minutes each morning engaged in some form of meditation. Start a gratitude journal and record what you are grateful for each day. This can be a great reminder of what is most important to you and what brings you the greatest happiness.

Stress control using spirituality

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Spirituality is the concept of a belief in something. Spirituality offers a worldview that suggests there is more to life than just what people experience on a sensory and physical level. Instead, it suggests that there is something greater that connects all beings to each other and to the universe itself.

Spirituality and religious activity have been a source of comfort and relief from stress for multitudes of people. While people use many different religions and paths to find God or to express their spirituality, research has shown that those who are more religious or spiritual and use their spirituality to cope with challenges in life experience many benefits to their health and well-being.

Spirituality is not a single path or belief system. There are many ways to experience spirituality and the benefits of a spiritual experience. For some people, this might involve the belief in a higher power or a specific religious practice. For others, it may involve experiencing a sense of connection to a higher state or a sense of inter-connectedness with the rest of humanity and nature. For others, it may involve experiencing a sense of connection to a higher state or a sense of inter-connectedness with the rest of humanity and nature. Some signs of spirituality may include. Asking deep questions about topics such as suffering and what happens after death, Deepening connections with other people, experiencing compassion and empathy for others, Experiencing feelings of interconnectedness, Seeking happiness beyond material possessions or other external rewards, Seeking meaning and purpose. Not everyone experiences or expresses spirituality in the same way. Some people may seek spiritual experiences in every aspect of their lives, while others may be more likely to have these feelings under specific conditions or in certain locations.

There are a number of different reasons why people may turn to spirituality, some of them are :

- To find purpose and meaning: Exploring spirituality can help people find answers to questions they have about philosophical questions such as "what is the meaning of life?" and "what purpose does my life serve?"
- To cope with feelings of stress, depression, and anxiety: Spiritual experiences can be helpful when coping with the stresses of life.
- To restore hope and optimism: Spirituality can help people develop a more hopeful outlook on life.
- To find a sense of community and support: Because spiritual traditions often involve organized religions or groups, becoming a part of such a group can serve as an important source of social support.

One potential pitfall of spirituality is a phenomenon known as spiritual bypassing. This involves a tendency to use spirituality as a way to avoid or sidestep problems, emotions, or conflicts. For example, rather than apologizing for some type of emotional wound you have caused someone else, you might bypass the problem by simply excusing it and saying that "everything happens for a reason" or suggesting that the other person just needs to "focus on the positive."

Although some researchers have suggested that the extent of spirituality's benefit on health is exaggerated, most researchers agree there is a positive relationship between religious and spiritual practices and better health outcomes.

The positive impact of spirituality on humanity and health

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Since virtue is an excellent trait of the human that would be gained throughout one's life, therefore, spiritual education may play a positive role in the development of the mentioned characters. The present article finds the effects of spiritual education on the achievement of virtues. The articles were searched through Web of Science, PubMed, Scopus, and Google scholar. Based on this analytic article review, spirituality has a positive effect on health and wellbeing; therefore, ethical problems could be improved through spirituality which is the main part of recent psychological interventions. Peace, wellbeing, and happiness in the world are mostly related to the virtues of individuals. The scientific studies found a positive significant relationship between spiritual education and good behaviour. The knowledge of two inner sources of thought, feelings, and beliefs in every human entity is a very important component of such education. The inner part (thoughts, feelings, and beliefs) of humans contains positive and negative aspects, also called Heart and Nafs respectively. The heart is responsible for virtues and Nafs is responsible for evils. Every person should look for strengthening oneself heart through spiritual ways. The heart strength mostly via spiritual education and activities conducted by spiritual persons, friends, or teachers. A spiritual person should have effective speeches and good moral characters that influence the heart and mind of people. The awaked heart can positively stimulate the cognitive-affective personality system to perform good characters. The Nafs also can negatively stimulate this system and lead to bad characters. Spiritual education must be available to children and adolescents within school or communities for gaining virtues. Spiritual education is one of the most effective ways of gaining a good moral character. The best spiritual education model described that every speech and activity rooted in the heart effectively activates the cognitive-affective personality system and established admirable behaviours. This kind of education is the best way to have a peaceful and happy world. It also would result in the unity of people of different ethnicities, races, nations, and religions.

The importance of good moral characters for the wellbeing and happiness of humans' life is demonstrated by various religions, philosophies, and researches. The role of spirituality observes from intrauterine life on the behaviour of the foetus and then it influences the behaviour of neonates, infants, children, adolescents, and adults. There are strong data that spirituality and virtues have a positive significant relationship with each other; and both of them play a crucial role in the improvement of physical and mental health, life satisfaction, social relationship, work performance, organization commitment, and leadership. Spirituality may also have a preventive and therapeutic role in the management of health crises like the Covid-19 pandemic. Therefore, the studies denoted that opportunities must be available within schools, universities, and communities for children, adolescents, and adults to learn admirable moral characters. Based on this analytic review; spiritual education is one of the most effective ways for learning, gaining, and performing excellent traits and virtues. The best spiritual education model established by Baba Sahib recently, the speeches and activities rooted in the heart effectively stimulate and activate the cognitive affective personality system and establish admirable behaviours. Everyone should search for their spiritual heart and find a way for its strength. Spiritual virtue persons, friends, teachers, or leaders can transfer or give heart rooted virtues via speeches and activities to other hearts. Virtues, worship, and prostration augment spirituality. The mentioned education can develop spiritual friendship between individuals of families, organizations, and societies. Spiritually educated peoples' and families' relationships and meetings are required for the strength of better moral characters. Such education and relation is the best way to have a peaceful and happy world. People with different ethnicity, race, nationality, and religious believers would become united through this view.

Spirituality in daily life

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In our daily life, whatever we do, if we do it consciously, it is all about spirituality. Things that are done consciously make some sense (may or may not be logical) in the context. To do things sensibly one requires spirituality. Fundamentally spirituality is the journey into the inner world to evolve self-consciousness. It is not a philosophy but it is a methodology (yoga, meditation) to organize body, mind, emotions, and energies for transiting to a higher level of consciousness. For a seeker, the intent for spirituality may be diverse and in fact, it is determined by his present state of consciousness(intellect). Spirituality is regarded as “Kalpavrush”, so for a seeker, it is very essential to keep intent right (sensible), because they are fulfilled in the same nature. Spirituality connects a seeker with nature and reveals his true nature with all the virtues: happiness, mindfulness, forgiveness, and so many countless qualities of the supreme soul, and above all it evolves human beings with humanity. As we all belong to “Grahashtashram”, and live in society, we need to seek the crown of humanity.

A conscious person will be always connected with nature and will always exercise sensible implementations for the well-being of others. The greed for position, name, fame, and awards will never disturb him. A conscious person always strives for the well-being of others, and that fuels him the power to face the odd situations in life. He is always beyond rules and regulations and attempts to resolve the issues with humanity in a sensible manner. He connects the people with emotions and not by policies. For the current situations in the world, we need people who believe in humanity and not in morality. Let us strive for that ultimate truth.

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Prof. Poornima Raikar

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