"PATHWAY OF PROGRESS" CONFERENCE PROCEEDING

DR. SNEHAL K JOSHI
(Chief Editor)
DR. HETAL PANCHAL
(Co-Editor)

Dolat-Usha Institute of Applied Sciences and
Dhiru-Sarla Institute of Management & Commerce
[Managed by Shri Nootan Kelavani Mandal, Valsad]

"PATHWAY OF PROGRESS" CONFERENCE PROCEEDING

International Conference : AFTBIS-2025 and
National Conference : MBPGSGC-2025

Chief Editor :

Dr. Snehal K. Joshi

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“Pathway of Progress”

Conference Proceeding

Of

International Conference

Event Sponsoror

1RIVET

“Advancing Future Transformation of Business, Industry, and Society: The Synergy of AI, Data, Semiconductors, Cybersecurity, and Emerging Technologies (AFTBIS-2025)”

Held On

11th and 12th January, 2025.

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Editorial Board

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Conference Proceeding

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National Conference

“Microbial Biotechnology: Pioneering Green Solutions for Global Challenges (MBPGSGC-2025)”

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GSBTM

TRANSCRIPTING BRIGHTER BIO FUTURE

Held On

11th and 12th January, 2025.

Department of Science & Technology

Government of Gujarat

Dr. Snehal K Joshi

(Chief Editor)

Dr. Hetal Panchal

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Editorial Overview

Dr. Snehal K Joshi

I/C Principal

Dept.Head (Computer Department)

Dolat-Usha Institute of Applied Sciences, Valsad

Acknowledgement

We acknowledge our **1Rivet, GSBTM(Gujarat State Biotechnology Mission) and DST(Department of Science & Technology, Govt. of Gujarat)** for their generous financial assistance and support for organizing conference.

It is with immense pride and gratitude that I present the proceedings book "Pathway of Progress" for the dual conferences, *"Advancing Future Transformation of Business, Industry, and Society: The Synergy of AI, Data, Semiconductors, Cybersecurity, and Emerging Technologies (AFTBIS-2025)"* and National Conference with theme *"Microbial Biotechnology: Pioneering Green Solutions for Global Challenges (MBPGSGC-2025),"* held on January 11th and 12th, 2025. These two parallel conferences, while addressing different yet equally transformative themes, have come together to form a unique collaborative platform for advancing the future of business, technology, sustainability, and science. As the convener of this landmark event and the chief editor of this proceedings book, I am deeply honoured to reflect upon the outstanding contributions of all the participants, our valuable resource persons, governing body of Shri Nootan Kelavani Mandal, organizing team of Dolat-Usha Institute of Applied Sciences and supporters who made this event possible and successful. I am also very much thankful to our valuable event partner 1Rivet and CEO of the organization. MBSI(Microbiology Society of India) played a major role to initiate the conference and selected our institute to host this event. I am privileged to share the collective achievements of this conference, which brought together some of

the brightest minds and visionaries from academia, industry, and research institutions around the world.

The two conferences, while distinct in their thematic focus, converge on the shared goal of exploring and advancing solutions to the global challenges of today and tomorrow. The first conference, *"Advancing Future Transformation of Business, Industry, and Society,"* centred on the transformative power of cutting-edge technologies such as Artificial Intelligence (AI), Data Science, Semiconductors, Cybersecurity, and other emerging innovations. The discussions ranged from the role of AI in automating industries and personalizing services to the advancements in semiconductor technologies and their profound influence on computing, communications, and even healthcare. The increasing importance of cybersecurity as a pillar of trust in the digital age was also extensively discussed.

The second conference, *"Microbial Biotechnology: Pioneering Green Solutions for Global Challenges,"* focused on one of the most promising frontiers in biotechnology—the role of microbes in providing sustainable, environmentally friendly solutions to pressing global challenges such as climate change, waste management, and sustainable agriculture. Researchers presented their work on the innovative applications of microbial biotechnology in biofuels, bioremediation, soil health, and waste-to-resource technologies. This conference highlighted how microbial systems are not just solutions to environmental problems but are also key enablers of the green revolution that is vital to addressing the climate crisis.

The synergies between these two conferences were evident in the collaborative discussions, as the integration of microbial biotechnology and cutting-edge technologies such as AI and data analytics is opening new frontiers in the study and application of sustainable solutions. The interdisciplinary nature of both conferences was emphasized through joint sessions, where participants discussed how advances in technology can accelerate the impact of biotechnology and vice versa.

The success of this joint conference was due to the exceptional efforts of a diverse team of researchers, academics, industry professionals, and technical staff who worked tirelessly to bring together the best minds in their respective fields. Over 400 participants from various research institutions, corporate sectors, and academia joined us in this unique event, contributing papers, articles, and posters that will enrich the pages of this proceedings book.

First and foremost, I would like to extend my sincere gratitude to all the researchers, scientists, and scholars whose work is featured in this proceedings book. The range of research presented—from AI algorithms to microbial solutions—has been truly inspiring. Your hard work, creativity, and innovative ideas are the backbone of this conference, and

the depth of your contributions has ensured that this event has left a lasting impact on all attendees. Your research has sparked new dialogues, led to fruitful collaborations, and will undoubtedly inspire future advancements in your respective fields.

The value of the research papers, articles, and poster presentations cannot be overstated. These contributions reflect the cutting-edge knowledge and pioneering efforts in AI, data, cybersecurity, and biotechnology. The interdisciplinary nature of this event has demonstrated how solutions from one field can be applied to another, whether it be leveraging AI for optimizing microbial processes or using data science to enhance the prediction capabilities of biotech solutions.

I would also like to extend my heartfelt thanks to the resource persons who graciously shared their invaluable expertise during the conference. The keynote speakers and session chairs, drawn from some of the leading research institutions and corporations worldwide, brought unique perspectives to their respective areas. Their lectures covered topics ranging from the ethical challenges of AI deployment to the latest advancements in microbial biotechnology for environmental sustainability. Their deep knowledge and thought-provoking discussions have added tremendous value to the conference and are sure to guide future research and applications.

The role of our resource persons was not limited to lectures; their presence fostered insightful panel discussions and interactive Q&A sessions, where participants could engage in meaningful dialogue. This engagement was key to bridging the gap between academia and industry, and their contributions were integral to making this event a success.

As we look back on the two days of thought-provoking sessions, it is clear that the synergies between AI, data analytics, semiconductors, cybersecurity, and microbial biotechnology will continue to shape the future of business, industry, and society. The research and discussions presented during the conference underscore the importance of integrating these fields to create innovative, sustainable, and scalable solutions.

For example, AI-driven analytics is increasingly being used to optimize microbial processes in bioremediation and biofuel production, and semiconductor technology is helping to create more efficient and powerful computational models to simulate complex biological systems. Similarly, the application of data science to the study of microbial ecosystems is opening new doors to understanding how microbes interact with their environment, leading to more effective environmental solutions.

It is our hope that the collaborations sparked during this conference will continue to grow and that the research presented here will serve as the foundation for further innovation in both technology and biotechnology. The discussions we have had over these two days are just the beginning of an ongoing dialogue that will continue to shape the way we address the world's most pressing challenges.

I would like to once again extend my deepest thanks to all those involved in making this dual-conference event a success. To the participants, researchers, speakers, organizers, and supporters, your contributions have been invaluable, and your dedication to advancing knowledge and solving global challenges is truly commendable.

This proceedings book stands as a testament to your collective efforts, and I am confident that the ideas, collaborations, and research presented here will continue to inspire and drive innovation in the years to come. As we work together towards a more sustainable, equitable, and technologically advanced future, I look forward to seeing the continued progress that will emerge from the synergy of these powerful fields.

Thank you for your participation, and for your unwavering commitment to advancing the future of business, industry, and society through technology and science.

Dr. Snehal K Joshi

Convenor & Chief Editor

AFTBIS-2025 & MBPGSGC-2025

Disclaimer

This publication contains the proceedings of the dual conferences: **"Advancing Future Transformation of Business, Industry, and Society: The Synergy of AI, Data, Semiconductors, Cybersecurity, and Emerging Technologies (AFTBIS-2025)"** and the **National Conference on the theme "Microbial Biotechnology: Pioneering Green Solutions for Global Challenges (MBPGSGC-2025),"** held on January 11th and 12th, 2024.

The proceedings include abstracts, research papers, and research articles submitted by participating authors. Two reviewers using blindfold method approved all submissions. Following to this it was checked for plagiarism using open source plagiarism software, and only those with a similarity index of less than 20% were accepted. Authors have provided undertakings affirming that their submissions are original works.

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– Editorial Board

From the Desk of Head of the Institute

It is with immense pride and joy that I extend my heartfelt gratitude and congratulations to everyone gathered here on the occasion of the parallel conferences organized by our institute: The **International Conference on "Advancing Future Transformation of Business, Industry, and Society: The Synergy of AI, Data, Semiconductors, Cybersecurity, and Emerging Technologies (AFTBIS-2025)"**, organized by the Computer Department of the Institute and The **National Conference on "Microbial Biotechnology: Pioneering Green Solutions for Global Challenges"**, hosted by the Microbiology Department of the Institute in collaboration with the Microbiology Society of India (MBSI). These conferences, organized on the 11th and 12th of January 2025, are a testimony to our institute's commitment to fostering innovation, interdisciplinary research, and collaboration.

The successful organization of this dual-conference event would not have been possible without the visionary leadership and continuous support of **Shri Nootan Kelavani Mandal**, our esteemed parent organization. I would like to express my deepest appreciation to the **President Shri Swatiben Lalbhai, Vice President Shri Kishanbhai Desai, Hon.Secretary Shri Kirtibhai Desai, Assistant Secretary Shri Anishbhai Shah, and all the Trustees of the Mandal.** Your unwavering support in terms of resources, planning, and strategic guidance has been crucial in making this conference a reality. Their commitment to education, research, and social impact resonates deeply with the ethos of this conference, and their efforts have created an environment where cutting-edge research and transformative technologies can thrive.

A special mention must also be made of the organizing committee, faculty members from Computer and Microbiology department and volunteers who worked diligently behind the scenes. Their commitment to ensuring the smooth execution of the conference—from coordinating sessions and managing logistics to ensuring seamless communication—was indispensable. The success of an event of this scale depends on the hard work and coordination of many individuals, and I am deeply grateful to each one of them for their contributions. Their attention to detail and professionalism made this conference an enriching experience for all involved. My sincere appreciation to the **event partner 1Rivet and CEO Mr.Harikrishna Nair** for their invaluable support.

A special note of appreciation to our esteemed **Chief Guest (Inaugural Function), the Vice Chancellor of Veer Narmad South Gujarat University**, for gracing this occasion and inspiring us with their presence and **Chief Guest(Valedictory Function), the Registrar** of **Veer Narmad South Gujarat University, for** his valuable presence**.** I also extend my

gratitude to the **Microbiology Society of India (MBSI)** team, Dr. Gaurav Shah (President-MBSI-Gujarat Chapter), the distinguished **resource persons**, **all reviewers, session chairs, judges,** the enthusiastic **researchers**, **academicians**, and the **corporate delegates** whose participation enriches these conferences.

The publication of conference proceedings with an US-ISBN, encapsulating the knowledge shared during the sessions, is a significant milestone that will contribute to academic and industrial advancements. These events embody the spirit of collaboration and innovation, paving the way for sustainable growth and transformative solutions to global challenges. Let us continue to strive for excellence and make meaningful contributions to society.

Dr. Snehal K Joshi

I/C Principal
Head of the Institute

Re Accredited by NAAC with ' B++, 2.86 CGPA ' Grade

VNSGU | VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

DR. Kishorsinh N. Chavda
Vice Chancellor

No.: VCO/24989/2024

Date: 06/12/2024

MESSAGE

Greeting from Veer Narmad South Gujarat University, Surat!

It is with great pleasure and honor that extend my warm greetings to all the distinguished delegates, scholars, researchers, academicians, and industry leaders gathered here for this prestigious International Conference on Computer Science, IT, A1, Semiconductor, and Industry 4.0, as well as the parallel National Conference on Microbiology and Biotechnology.

This event, organized by the Dolat-Usha Institute of Applied Sciences, Valsad, stands as a remarkable platform for sharing knowledge, fostering innovation, and bridging the gap between academia and industry. It is heartening to see over 300 enthusiastic participants from various domains, contributing to more than 200 research papers and articles. The sheer depth and diversity of the research presented at this conference reflect the tremendous advancements and collaborative spirit in the fields of Computer Science. IT, Artificial Intelligence, Biotechnology, and Microbiology.

I am particularly excited to note the release of the conference proceedings, which will be published by an esteemed international publisher and will carry an ISBN number. This milestone highlights the exceptional quality of research and the significant impact of this conference in shaping future developments. It is an achievement that reflects the hard work, dedication, and passion of all those involved.

I would like to take this opportunity to acknowledge and express my sincere gratitude to Dr. Snehal Joshi, Principal of Dolat-Usha Institute of Applied Sciences, for her visionary leadership, tireless efforts, and commitment to excellence in organizing this landmark event. Her vision and the invaluable contributions of the entire organizing team have made this conference a reality. Without their dedication and teamwork, this gathering would not have been possible.

As we stand at the threshold of technological and scientific breakthroughs, it is events like this that help drive progress and innovation. This conference serves as a testament to the importance of cross-disciplinary collaboration and knowledge exchange, which are essential in addressing the challenges of' our rapidly changing world.

I am confident that the discussions, deliberations, and insights gained here will not only enrich our understanding but also pave the way lot future collaborations and innovations. I wish the participants all the best in their endeavors and hope that the outcomes of this conference will continue to inspire and shape the future of science, technology, and industry.

Once again, my hear felt congratulations to all the participants, organizers, and contributors. May this conference be a great success, and may it lead to fruitful partnerships and ground-breaking discoveries.

With best wishes for a successful event.

Warm regards,

Dr. Kishorsinh N. Chavda

V ice-Chancellor

DR. RAMESHDAN GADHAVI

Registrar

MESSAGE

On behalf of Veer Narmad South Gujarat University, Surat, I extend my warmest congratulations to the organizers of the International Conference on “Advancing Future Transformation of Business, Industry and Society: The Synergy of A.I., Data, Semiconductor, and Emerging Technologies” and the National Conference on “Microbial Biotechnology: Pioneering Green Solutions for Global Challenges”, held on the 11th and 12th of January.

These conference, hosted by the esteemed Dolat Usha Institute of Applied Sciences and Dhiru Sarla Institute of Management and Commerce, Valsad, will provide a platform for insightful discussions and groundbreaking research.

We wish the organizers and participants continued success in their future endeavours.

Yours faithfully,

Veer Narmad South Gujarat University, Surat.

MS. SWATIBEN LALBHAI

President,

Shri Nootan Kelavani Mandal, Valsad

November, 2024

MESSAGE

The integration of ideas by the confluence of Medical sciences and Technology resulting in STEM has put humanity on the verge of a thrilling period in history. Present research in AI and Microbial Biotechnology in its nascent stage puts a lot of questions on its manifestations and the challenges posed by the exponential explosion of unknown possibilities. Humans will be both enriched and challenged as our species breaks its genetic legacy and achieves inconceivable heights of intelligence, material progress and longevity.

The future of this planet will be bright if these developments are accompanied by wisdom emerging out of spirituality.

I wish the distinguished minds the very best outcomes to enhance the public awareness and for the changes in the way we think and live.

SHRI KIRTIBHAI DESAI

Secretary

Shri Nootan Kelavani Mandal, Valsad

November, 2024

MESSAGE

I am happy to know that Dolat – Usha Institute of Applied Sciences and Dhiru – Sarla Institute of Management & Commerce is going to organise two parallel conferences on 11th and 12th January, 2025 and publish conference proceedings in a book with ISBN.

The topics of International Conference – Advancing Future Transformation of Business, Industry and Society: The Synergy of AI, Data, Semiconductors, Cybersecurity and Emerging Technologies and National Conference – Microbial Biotechnology: Pioneering Green Solutions for Global Challenges are interesting and need of the hour. This will really help the students and faculties to understand and gain knowledge from the conference.

I wish all the success to you and entire team of our esteemed institute a grand success.

Thanking you for extending an invitation to send message.

ANISH SHAH

Assistant Secretary
Shree Nootan Kelavani Mandal, Valsad

November, 2024

MESSAGE

Dear Dr Snehal Joshi,

On behalf of Shree Nootan Kelavani Mandal, I would like to extend my sincere congratulations and appreciation to the Dolat Usha Institute of Applied Sciences for successfully hosting the **International Conference on Advancing Future Transformation of Business, Industry and Society** and the **National Conference on Microbial Biotechnology: Pioneering Green Solutions for Global Challenges** on 11th & 12th January, 2025 in our college campus.

These conferences not only provided an invaluable platform for the exchange of innovative ideas and research but also highlighted the significant role of academic institutions in shaping the future of business, industry, and society, as well as advancing sustainability through microbial biotechnology. The topics addressed were of immense importance, and it was inspiring to witness the collaborative efforts of experts, researchers, and professionals coming together to share knowledge and chart a path forward for a more sustainable and transformative future.

I commend your dedication to creating such meaningful forums for discussion and learning, and I am confident that the outcomes of these conferences will have a lasting impact on the respective fields. I look forward to future opportunities to collaborate and engage with the Institute on similar endeavours.

Thank you and your team once again for your hard work and commitment to advancing global knowledge and innovation.

My best wishes to you & Team DUIAS and DSIM&C, Valsad for hosting the Internation and National Conferences.

1RIVET

Harikrishna Nair

CEO

1Rivet - India

MESSAGE

On behalf of 1Rivet, it is our privilege to welcome everyone to the International Conference organized by Dolat-Usha Institute of Applied Sciences, Valsad. The event's focus on pivotal areas such as Computer Science, IT, Artificial Intelligence, Semiconductors, Industry 4.0, as well as Microbiology and Biotechnology underscores the critical importance of fostering innovation and research in these domains. This collaboration between academia and industry is more vital than ever, as we collectively navigate a rapidly evolving technological landscape.

The Need for Research in Key Fields : Today's world demands groundbreaking research in areas such as AI/ML, Quantum Computing, Semiconductor etc. These fields hold transformative potential, driving advancements in automation, healthcare, education, and sustainability. It is imperative to cultivate a culture of inquiry and collaboration to ensure we remain at the forefront of these technological revolutions.

Bridging the Gap: Academia and Industry Collaboration : The synergy between academia and industry is indispensable. While academic institutions excel in foundational research and skill-building, industries bring practical insights and resources to transform theoretical concepts into real-world applications. However, a noticeable gap persists between the requirements of industries and the programs offered by colleges and universities. This disconnect underscores the need for a dynamic approach to education;

one that aligns academic curricula with the skills and expertise demanded by global industries.

Reimagining Curriculum Design : To address this gap, institutions must adopt a forward-thinking approach to curriculum design. Incorporating emerging technologies such as AI, Blockchain, IoT, and Renewable Energy Systems into academic programs will better prepare students for the challenges of tomorrow. Additionally, fostering interdisciplinary learning—blending technology with management, design, and life sciences—can create holistic professionals capable of solving complex, real-world problems.

The Global IT Scenario and India's Growth Prospects : Globally, the IT industry continues to thrive as a cornerstone of economic growth and innovation. As a leader in IT services, India has proven its capability to deliver cutting-edge solutions. However, with the global shift towards automation, data-driven decision-making, and sustainable practices, the Indian IT sector must pivot to, and in some ways have already started pivoting to, high-value areas like AI research, cybersecurity, cloud computing, and semiconductor manufacturing. Investments in upskilling and reskilling our workforce will be crucial to maintaining our competitive edge.

Promising Technologies and Future Needs : As we look ahead, technologies such as AI-driven drug discovery, sustainable semiconductor technologies, advanced robotics, and bioinformatics offer promising avenues for growth. These innovations have the potential to address critical challenges, including climate change, healthcare accessibility, and food security. Focusing research efforts on these domains will not only yield technological breakthroughs but also position India as a global leader in innovation.

In conclusion, events like this conference play a pivotal role in fostering dialogue, sharing knowledge, and driving meaningful collaborations. 1Rivet is committed to supporting initiatives that bridge the gap between academic exploration and industrial application. Together, we can pave the way for a brighter, more innovative future.

International Conference

"Advancing Future Transformation of Business, Industry, and Society: The Synergy of AI, Data, Semiconductors, Cybersecurity, and Emerging Technologies (AFTBIS-2025)"

EVENT AND PROGRAM SCHEDULE

Day-1 - (11/01/2025) (Saturday)	
9:45 am to 11:10 am	Inaugural Session in presence of Chief Guest and Guest of Honours
11:30 am to 12:30 pm	**Plenary Session-1 : "Artificial Intelligence of Things - AI in IoT "** Dr. Soma Pandey (B.Tech.(Computer)(NIT), M.S.(Embedded Systems), Ph.D.) Ass. Vice President, IoT Engineering – Jio Platforms Ltd., Bangalore, India
12:35 pm to 1:35 pm	**Plenary Session-2 : "ERP-Reimagined: Cloud-First & Embedded A.I. – A pathway to future proof business."** Mr. Mukesh Rai (B.E.(Mech.)(NIT), Masters (I.T.) (IIIT), M.B.A.(IIM)) Principal Engagement Manager, SAP Australia, Sydney, Australia
1:45 pm to 2:30 pm	Lunch @ Sanksar Kendra

2:30 pm to 3:30 pm	**Plenary Session-3 : "Navigating the Digital Frontier: Safeguarding Against Threats in Technological Advancements."** Dr. Vishwas Raval (B.E.(I.T.)(Guj.Univ.), M.Tech.(CSE)(IIT Roorkee), Ph.D.(M.S.Univ.) Associate Professor & Chief Information Security Officer, Central University of Gujarat, Vadodara, India
3:30 pm to 4:15 pm	Networking Session with High Tea & Group Photograph
4:45 pm to 5:30 pm	Cultural Programs @ Sanskar Kendra

Day-2 - (12/01/2025) (Sunday)	
9:45 am to 10:45 am	**Plenary Session-4 : "Integrating IoT with Semiconductor Technologies"** Dr. Vipul Patel Ph.D.(Semiconductor & Optics) (NJIT, U.S.) Principal Scientist, CISCO Systems, California, U.S.A.
11:00 am to 12:30 pm	Research Paper Presentation (For Track-1 , Track-2 and Track-3)
12:30 pm to 1:30 pm	**Plenary Session-5 : "Technological Convergence "** Mr. Sairam Mannar (B.Tech.(Electronics)(NIT), I.E.S.(Indian Engineering Services)) Director, Programs & Business Development (TCS), Technology Consulting & Implementation, Düsseldorf, Nordrhein-Westfalen, Deutschland (Germany)

1:30 pm to 2:15 pm	Lunch @ Sanksar Kendra
2:30 pm to 3:30 pm	Research Paper Presentation (For Track-4 , Track-5)
3:45 pm to 4:30 pm	Valedictory & Group Photograph
4:30 pm to 5:00 pm	Tea & Group Photos

MUKESH KUMAR RAI

(B.E.(Mech.)(NIT), Masters (I.T.) (IIIT), M.B.A.(IIM))

Principal Engagement Manager

SAP Australia,

Sydney, Australia

ERP 'Reimagined': Cloud-First & Embedded AI - a pathway to future-proof business

Enterprise resource planning (ERP) is a software system that helps organisations streamline their core business processes. While the term ERP was coined in 1990's, the history of ERP can be traced back to the 1960's, when manufacturing companies started using computerized business applications. By 1990's, ERP had expanded into multiple business applications across diverse industries. In the recent years, after introduction of browser-based software; the adoption, scope, and functionality of ERP has grown even further. The release of ChatGPT in November 2022 has been a watershed moment for Generative Artificial Intelligence (AI) applications; ERP vendors are increasingly using it in their applications, to increase their competitiveness.

ChatGPT has democratized access to large language models (LLMs). AI adoption has surged, and analysts are predicting annual growth of more than 50% for AI market. ERP considers artificial intelligence (AI) not as a standalone technology but as an integrated part of business systems that inherently integrate intelligence into business processes. ERP vendors prefer to deliver these AI capabilities over cloud vis-à-vis traditional on-premises model. Delivery using the on-premises model might necessitate additional project work due to highly customized environment. The delivery of the AI capabilities using cloud ERP ensures speed, agility, quality and efficiency.

Stand-alone Generative AI is great in crunching numbers and finding patterns. Use of Generative AI technology in an enterprise setting, however, is quite different from using it for private, individual use. Usage of Generative AI in ERP, therefore, calls for supporting a totally different level of complexity - Generative AI in context of ERP can be termed as

'Business AI' to highlight the business value to be derived from AI. The current Generative AI models have limitations like 'hallucinations' which generate outputs that might not align with reality. ERP solutions mitigate this limitation by 'grounding' i.e. augmenting the LLMs with customers' data to generate results that are contextual and relevant to their specific business environment.

Generative AI is trained on mostly uncrated data sets that might not account for balance, freedom from bias or errors. ERP vendors/users recognise that high quality data fuels AI & there is a time and cost associated for a business to have a good data set. To maintain data relevant for training models, businesses must handle the challenges of classifying, cleaning, and updating it.

Business AI is characterized by three R's: 'Relevant', 'Reliable' and 'Responsible'. It is critical for Business AI to be 'Relevant' for business and should be embedded in the business processes. Business AI should be 'Reliable' and follow enterprise standards with accurate and real time results. Business AI should be 'Responsible' and incorporate AI safety, ethics, security and compliance.

Co-Pilots for Business AI bring down the threshold of interacting with ERP systems. It allows user to interact with the system with natural language, in a contextual manner and brings down the threshold of interacting with ERP. An ERP co-pilot needs to break down silos by combining agents that are experts in supply chain, procurement, finance, HR, and more to drive efficiency across business processes. The user interacts only with the ERP co-pilot, which in turn collaborates with various AI agents, which are experts in respective business functions.

With advancement in Generative AI, the trend is to transition from low agency agents (static, reactive, supervised) to high agency (Autonomous, adaptive and proactive). However, these advancements will take time to mature. Generative AI is still in its early stages and the hype is unprecedented. Most of the investment on Generative AI technology is currently coming from Technology companies. The businesses are following the progress keenly – cost, security and employee impact are some of the biggest challenges that the businesses face.

"Success in creating AI would be the biggest event in human history. Unfortunately, it might also be the last, unless we learn how to avoid the risks." said Stephen Hawking. While the usage of Generative AI is increasing day-by-day, either as a stand-alone technology or embedded in ERP; the businesses need to be aware of the operational, ethical and data risks it might pose. In this context, businesses need to ensure relevant governance framework; the trend is quite evident with the rapidly increasing market size of AI governance.

DR. SOMA PANDEY

(B.Tech.(Computer)(NIT), M.S. (Embedded Systems), Ph.D.)

Ass. Vice President

IoT Engineering – Jio Platforms Ltd.,

Bangalore, India

Artificial Intelligence of Things: Past Present and Future

In 1956 the very first time the word 'Artificial Intelligence' was coined by Mac Carthy. Since then, we have come a long way. AI development has seen many hurdles, roadblocks and many winters. Initially AI has emerged in two separate camps of Symbolists and Connectionists. Symbolists always want to derive results, conclusions, decisions based on large amount of training data which results in some kind of learning and rules. This evolved into the very initial forms of AI called the expert systems. Then on other hand there were connectionists who believed in Synapse and therefore the other AI model was based on Artificial Neural Networks. Initially It seemed that Symbolists won by giving the very first AI machine called Cyc. But even till 2017 the Cyc had approximately 24.5 million rules and 1.5 million terms and still lacked any general intelligence. Whereas in 1988 itself the very first Connectionist model resulted in one of the most successful use cases of AI – The optical Recognition System by Le Cun and Bengio. Its advanced version is still used in the US for OCR. For a moment it may appear that symbolists lost, and connectionists won but the latest models of AI are hybrid models which are based on both ANN and Rule based inference engines. What was it that lifted the freeze on AI and was game changer for AI? Answer is World Wide Web. Non-Availability of training data and lack of good processors were always a hurdle for AI models which was addressed with the emergence of plenty of data in www and high-power processors and GPUs which helped scientists to train models with better accuracy. But even now with the best available models the intelligence is less than that of a 2-year-old.

Common challenges faced in AI models training are

1. Brittleness: flip an image and the image recognition software fails to recognize it
2. Embedded Bias: unintentionally US health program decided to give priority to white people for treatments. The decision was based on the fact that whites were spending more on health, so they are sicker. Whereas the reason was that whites are more affluent, so they were spending more.
3. Catastrophic forgetting: An AI model trained to differentiate between pictures of dogs and cats is unable to differentiate between bus and car. If it is taught to differentiate between bus and car it forgets to differentiate between dogs and cats
4. Explainability: AI will take accurate decision on medical or legal predictions but if asked how it reached conclusion it is unable to backtrack and explain with logic
5. Lack of Common sense: It cannot understand intent behind a text. Difference between sarcasm and joke, list can go on
6. Poor in Math: Can only do 5% of high school problems

Booking a ride, trip to and from home on google maps is not AI. But traffic congestion estimation based on speed of moving vehicle is AI. Artificial Intelligence of Things requires Things to start taking decisions on their own. Something which is not coded but is done by the IoT device due to training. The largest Artificial Intelligence of Things use case applied to self-driven cars, cameras, healthcare and Industry 4.0. Telecom is another sector which has started applying AI to some use cases for example customer lifetime value, churn prediction, AI based billing, Intelligent virtual assistant. For communication service providers also, there are many AI use cases to apply in RAN eg. Spectrum sensing, channel quality estimation, hybrid beam forming

So how do we differentiate if a particular use case requires AI based solution or a simple rule based if then else solution?

The reason to ask this question is to make the audience understand that AI is not required everywhere. In fact, given the number of issues with AI it is always preferable to try to solve a problem without AI and use AI only if needed. In fact, so many use cases are based on simple coding rules but still for marketing the models are wrongly called AI models. Let's discuss the common challenges faced in doing an AI project

1. Gathering Data: It can cost one around $70000 to generate 100000 samples of data set

2. Annotating/labelling data: a solid dataset will set you back anywhere from $10,500 to $85,000, depending on the nature of your data and the complexity of your annotations.
3. Cleaning Data: many companies get outsourced data for cleaning, and they charge heavily
4. Accuracy and training process

These points may make you think twice before jumping on an AI boat. So, the conclusion is that whether IoT or any other use case AI may not always be the right and best solution.

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Telecom and IT Convergence towards Ubiquitous Intelligent Connectivity

Communication over the years has been a great focal point for technological convergence. However, it started with the concept of telecom networks, which focused on voice as a service, and a separate data network, which focused on data services like the Internet. The telecom network focussed on voice and mobility, while the data network focussed on increasing the bandwidth. This resulted in a multiplicity of networks both in the access and core. Consequently, there was a huge diversity in protocols and types of user equipment. Many applications were closely coupled with the network on which they could run. This was the situation through the 1990s. Technology and Application silos were the name of the game.

Things started changing from 2000 onwards with the concept of fixed mobile convergence. The telecom industry gradually moved from circuit-switched networks to packet-switched networks. Convergence aimed to simplify the diversity of the networks and reduce costs in the management of the network while allowing freedom of choice to the user to use any UE of his choice to access any application using multiple access mechanisms like copper, cable, fibre, wireless and satellite. When the network is unified, different kinds of use cases for voice and data for cross-industry applications can be implemented on the same network. In addition, security management becomes manageable with the concept of secure authentication. Sustainability is also enabled

through reducing the carbon footprint by simplification of the network and better energy management.

From 2.5G mobile technology onwards, data became more and more prominent, well into 3G and 3.5G. In 4G, circuit-switched technology was eliminated and voice became an application over data. IP and Ethernet became the standard norm in the mobile world. Today the 5G network technology is a representation of convergence. IP protocol which was inherent to data networks now forms the core of 5G. So do service-oriented architecture and network APIs. Today we have 9 Billion mobile phones and 20 Billion IOT devices globally, growing at a rapid rate and all of them are potentially able to inter-connect. The rapid adoption of satellite networks into the overall scheme of things has drastically revolutionized connectivity with the concept of always-on redundancy in connectivity and capacity.

With the convergence of IT into the telecom network, IT technologies like AI and cloud have been incorporated into the telecom network. Today's network is no longer proprietary hardware heavy. The separation of control and user planes resulted in the network intelligence moving into the cloud called NFV (Network Function Virtualization). Cloud was already offering data analytics as a service. On the one hand, AI was getting embedded into the network control place, while on the other hand, the cloud started also offering AI as a service. The enormous amount of data generated by IoT devices can be analysed on the cloud and made available to enterprises to derive insights into their business.

5G paved the way for industrial IoT on a large scale which has cross-industry applications. Both the human and the device could connect to the same network as an excellent example of true convergence. In addition, the location of humans and devices anywhere on the earth is feasible with the latest release of 5G. Another domain of convergence that has happened in 5G is in the area of APIs. 5G has a network exposure function that exposes network capabilities that can be used on demand by developers in their applications. Eg: bandwidth on demand, location service etc.

5G-Advanced and 6G will make this concept even more reliable and robust. These new technologies will start offering computing services and AI services, which will be natively built, using network APIs. 6G is anticipated to start rolling out in the early 2030s. While 5G offers ubiquitous connectivity through NTN with the usage of satellites, 6G will take this further by adding computing and intelligence to it. This is what we could call **Ubiquitous Intelligent Connectivity.** Several ML models that are industry and use-case-specific will be directly available for D2D (device-to-device) communications as well as for UE applications.

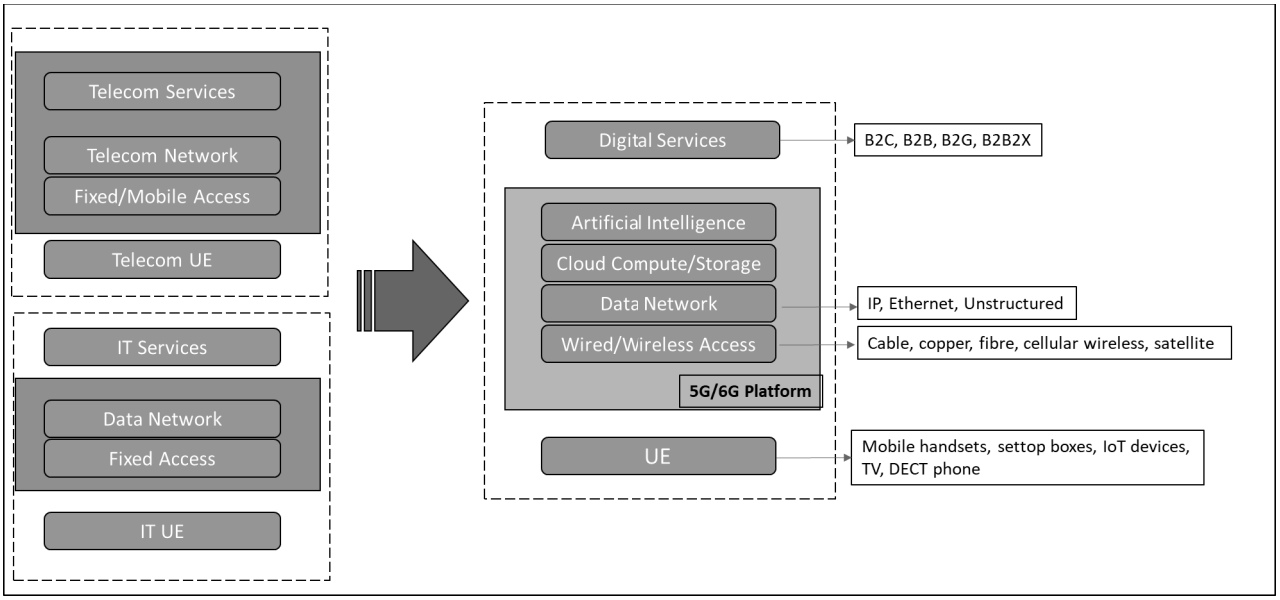

Figure:1

The convergence of telecom and IT technologies has resulted in ubiquitous connectivity as the network ensures connectivity in any place on the land and sea, building or in an aeroplane, forest or mountain.

On top of this AI brings in the power of intelligence to devices and humans to make decisions. While technology is converging towards Ubiquitous Intelligent Connectivity, the spread of the convergence is leading from the erstwhile vertical integration of the industry towards horizontal integration. This means the disaggregation of the Telco company. Telcos are now being split up into Towercos, Fibrecos, Netcos, Satcos and Servcos. This gives better investment focus and financial flexibility.

Towercos focus on the passive infrastructure. With 5G, Towercos can start owning up small cell implementation as well as WiFi hotspots. A potential business case for them would be setting up micro-data centres for MEC (multiple access edge computing). Fibercos, similarly can focus on fibre-to-home connections, which has been the long-term objective of many countries. Both Towercos and Fibrecos can play a crucial role in the development of smart cities. Netcos will offer the network as a platform for the next generation of services and applications to run on. Satcos will work closely with Netcos to offer front-haul, mid-haul, and back-haul services in addition to access services.

Servcos may divide themselves into Retail Servcos and Enterprise Servcos. Retail Servcos may eventually align themselves with retail companies to increase customer connect and long-term relationships. Their focus would be B2C. Enterprise Servcos will offer the bulk of enterprise services including industrial IoT to B2B, B2G and B2B2X customers. There

are, of course, pros and cons to this disaggregation. The market is currently learning from experience. The end could be a healthy mix of both vertical and horizontal integration.

In conclusion, technological convergence has spurred the telecom and IT worlds towards a common platform that offers connectivity, computing and intelligence which is accessible from any device situated on any part of this earth. Consequently, the business models of the telecom and IT industry will also undergo a rapid change that will be to the benefit of both the customer and the industry.

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Silicon Photonics- the future of optical interconnects

With exponential growth in demand for data, there is tremendous pressure on optical module manufactures to reduce cost/Gb of data. Silicon Photonics has the promise to meet current and future optical communication requirements of higher integration with higher bandwidth, lower power at lower cost. Packaging of Silicon Photonics enabled optical engines plays a key role in achieving these goals. Also, as the data rate and level of complexity are increased, more advanced packaging technologies such as 2.5D integration, TSVs, fanout technologies and 3D integration are being quicky adopted. In addition, power management is becoming a limiting factor for scaling the data center speed and size and advanced efficient cooling technologies such as liquid cooling of optical modules are being adopted.

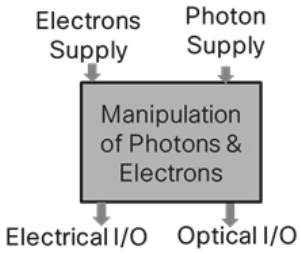
What is Silicon Photonics?

Silicon Photonics is an emerging technology bringing a paradigm shift in fiber-optic-based communications and data center connectivity. Silicon Photonics leverages mature and highly reliable CMOS fabrication and packaging infrastructure and takes advantage of more than 40 years of investment in proven CMOS IC technology, mitigating risks associated with esoteric fabrication technologies.

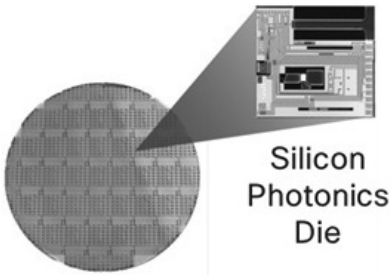
Silicon photonics technology allows formation of light guiding structures within an SOI silicon substrate and allows turning, splitting, modulation and detection of light within a Silicon Photonics IC. Except generation of light, Silicon Photonics can achieve all the

remaining functions needed for a transceiver for transmitting and receiving a digital signal to and from a fiber optic cable.

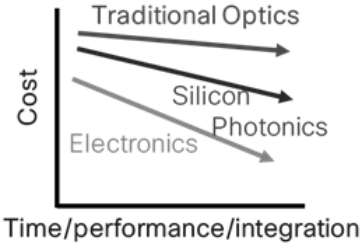
One of the key features of the Silicon Photonics is that various optical functional blocks such as waveguides, modulators, mux/demux and detector are implemented using standard layout, DRC, LVS, simulation used for fabrication of conventional integrated circuits.



Integrated Circuit With Optical I/O



Transceiver on a Silicon Wafer



CMOS/OSAT Mfg. Infrastructure

In contrast to the traditional approach of using discrete optical elements with precision placements and costly alignments, Silicon Photonics enables wafer scale manufacturing of optics with extremely high level of integration and scalability. Silicon Photonics can be used in both 1310nm (direct detect- within data centers) and 1550nm (coherent- between data centers and long haul) wavelength categories and can support PAM4 and advanced coherent modulation schemes covering a wide spectrum of products.

Applications of Silicon Photonics are not just limited to optical communication!!

In addition to optical communication, Silicon Photonics has many applications in a wide-ranging industry that have the potential to revolutionize the world. These applications include optical interconnects and new architectures for high performance exascale super computers [1], lab on a chip for biomedical testing and drug discovery [2], LIDARs for self-driving cars [3], reconfigurable antennas for radars [4] as well as chip scale optical frequency combs [5] for defense applications to name a few.

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Digital World: Threats and Precautions

In today's digital world, cyber security has become a critical concern for individuals, businesses, and governments alike. With the rapid advancements in technology, cybercrime is evolving at an alarming rate. Threat actors, ranging from lone hackers to organized criminal syndicates and nation-states, are leveraging advanced tools to exploit vulnerabilities. This article explores the significance of cyber security, common threats, and best practices to safeguard against cyber-attacks. So lets peep into the world of cyber threats.

Common Cyber Threats

Malware: They are malicious software, including viruses, worms, and ransomware, designed to damage or disrupt systems.

Adware, Spyware and Rootkit: Adware and spyware are both types of malware, which is short for "malicious software".

Phishing: It is a type of fraudulent attempts to obtain sensitive information by disguising as a trustworthy entity in electronic communications.

Man-in-the-Middle Attacks: It is about intercepting and altering communication between two parties without their knowledge.

Denial-of-Service (DoS) Attacks: This involves flooding the system with traffic to render it unusable.

Digital Arrest: It is a technique that is being used by cyber criminals to cheat people by pretending as some government officials.

SQL Injection: Inserting malicious code into a server using SQL to access and manipulate databases.

These attacks lead to severe loss. Following section gives a brief idea about impact of cyber-attacks.

The Impact of Cyber Attacks

Cyber-attacks can have devastating consequences, including financial loss, reputational damage, and legal repercussions. For businesses, a successful cyber-attack can lead to the theft of intellectual property, customer data breaches, and operational disruptions. For individuals, it can result in identity theft, financial fraud, and privacy violations. According to recent reports, the global cost of cybercrime is projected to exceed $10 trillion annually by 2025. Beyond financial losses, cyberattacks erode trust, disrupt services, and compromise privacy. In one more report, especially for India:

"India has become the top global target for mobile malware attacks, accounting for 28% of the total, surpassing the United States (27.3%) and Canada (15.9%). This significant jump from its 3rd place ranking last year underscores the critical need for Indian enterprises to adopt robust security measures, especially amid the rapid digital transformation and increasing cyber threats," the report said. (source: India tops global list for mobile malware attacks: report)

Having discussed about impact, now let's understand what is cyber security.

Cyber Security:

Cyber security refers to the practice of protecting systems, networks, and data from digital attacks. These attacks are often aimed at accessing, changing, or destroying sensitive information, extorting money from users, or interrupting normal business processes. Effective cyber security measures are designed to counteract these threats and ensure the confidentiality, integrity, and availability of information.

So, what exactly one should do to stay safe when they are connected to internet.

How Individuals Can Stay Safe?

For individuals, practicing good cyber hygiene can go a long way in mitigating risks. Here are some tips:

Use strong, unique passwords for all accounts and enable multi-factor authentication (MFA).

Be cautious of unsolicited emails or messages, especially those asking for sensitive information.

Sharing is not compulsory

Don't Accept cookies

Don't go on sites not having *http**s***

Use virtual keyboards wherever possible

Keep devices and software up to date with the latest security patches.

Back up important data regularly to an offline or cloud-based location.

Limit the sharing of personal information online.

Educate employees about cyber security best practices and how to recognize potential threats.

In India, the government and various organizations have been trying to create awareness and provide help to people. Section below gives an idea about what government of India is doing for creating digital literacy and cyber awareness.

The Role of Governments and Organizations

Governments and organizations play a crucial role in enhancing cyber security. Governments can enact regulations and provide resources to help protect critical infrastructure. Organizations, on the other hand, must invest in advanced security technologies and foster a culture of security awareness among employees. The government of India have created portals for helping people in case of cyber frauds.

https://www.ceir.gov.in/Home/index.jsp (for lost phones)

https://cybercrime.gov.in/ (for filing complaint, also 1930 toll free)

https://www.csk.gov.in/ (For support and tools)

https://sancharsaathi.gov.in/sfc/ (Chakshu facilitates citizens to report the suspected fraud communications through Call, SMS or WhatsApp

Conclusion

As cyber threats continue to evolve, the importance of cyber security cannot be overstated. By understanding the risks and implementing effective security measures, individuals and organizations can protect themselves against cyber attacks and ensure the safety of their digital assets. Most importantly having awareness and staying vigilant and proactive is key to navigating the complex landscape of cyber security in the digital age.

International Conference

"Advancing Future Transformation of Business, Industry, and Society: The Synergy of AI, Data, Semiconductors, Cybersecurity, and Emerging Technologies (AFTBIS-2025)"

Abstracts of

POSTERS

PRESENTATION

1RIVET

An Introduction: Big Data Analytics techniques and Tools

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Abstract

An increasing amount of data stored at rapid rates beyond the limits of standard. This rapid increase causes problems to store data, speed up transferring data, and security. This survey surveys the issues like large volume data management problems and difficult aspects in state of the art technology big data analytics. Handling a large number of datasets using traditional classification and management tools is more difficult [2]. Big data enables discovering the relationship among the stored datasets to process the data hassle-free. Above all this, it discusses available management tools for big data analytics.

Keywords- Big Data, Data Analytics, Challenges and Security issues.

Robotics application in : Healthcare, Education and Environment.

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Abstract:

This research poster shows the robotic application in healthcare , education and environment . It shows the advancement of the fields due to use .of robots , In the healthcare part you will see some of the robots use in the surgery , patient care and other functions. In the education part we can see the history of robots in this field and current uses . And in the environment section we can see some of the robots used to protect nature. With the provided data we can see that the use of robots is been increased by time. But we can see that the cost of having a robot in such sectors is higher, so not every organization can afford it. The higher cost is due to the manufacturing of the robots and their maintenance.

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4. 4] auther name : Prithish Panchal Mechanical Engineering Department, Sardar Vallabh Bhai National Institute of Technology, SVNIT, Surat, Gujarat, India Email: prithish467[at]gmail.com
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Data to Dominance: The Power of BI Dashboards

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Abstract

"Transforming business through data is not about having more information; it's about having the right information at the right time."- By Carly Florina interprets that abundance of data is not necessarily required rather small amount of data can yield best results if used well. This is where a BI Dashboard comes to rescue for all those who desires to work with data but cannot decode it. Over time, BI Dashboards have been playing a crucial role in the transformation of businesses in the real-time as it has a thoughtful approach by balancing data complexity and appropriate designs for representation in a wide way. Thereby leading an empowerment to predict unique patterns and uncover secrets enhancing the ability to make decisions that are data-driven increasing the possibility for more than predictable results. Designing BI dashboards involves adhering to principles while evaluating their impact throughout the development process. Myriad varieties of methodologies involve the better utilization of data and increase the effectiveness of the insights. Different ways of demonstrations include graphs, charts and objects to present categories of data accordingly. Designing a dashboard is transforming business in such a way that despite in the phase of disruption, it helps in making crucial and game changing decisions leading to its survival. So it has become a very crucial weapon in today's time against the race of competitive core of market. Therefore, a carefully designed BI Dashboards will have a greater impact on the structural and operational behavior on the organization leading it to great heights by successfully achieving the goal. So, a BI Dashboard can accelerate the journey of driving business transformation by its design.

Keywords: *Business Transformations, Business Intelligence, BI Dashboard Designing*

The Power of Cloud Security: Protecting Data and Privacy

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Abstract:

Cloud Security means to protect the data or resources that are stored on the cloud which is remotely located. Cloud Security is useful to keep your data secure, protect them from unauthorized access, prevent accidental deletion of data and make the data available at any particular time. Cloud security a major factor which should not be ignored by the user before establishing connection with the cloud. Cloud security is important because it keeps the data secure by preventing hackers to access, alter or delete any sensitive information on the cloud. So any security threat can be avoided by blocking them from accessing the cloud data in any unauthorized manner. cloud security is a multi-layered approach that involves controlling access, protecting data, detecting threats, ensuring compliance, planning for emergencies, and constantly monitoring. Cloud security is responsible for preventing unauthorized access, attack from hackers, data loss, data alteration, system failure etc.

Keywords: *Cloud Security, Unauthorized Access, hacking.*

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Cybercrime: Awareness against cyber crime and how to be safe

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Abstract

The Internet is a place almost everyone of us are connected with. As it provides us many useful resources that help us in every life, in business and maintaining social life, there are also many threats that would harm us. Cybercrime is that threat, in which criminal activity is targeted towards our data on any devices that are connected with the internet. Cybercrime is a growing problem that impacts people, businesses, and governments worldwide. Mainly the reason for cybercrime will be to take ransom amounts, alter data, theft of data or damaging devices. The purpose of this research is to inform people about different types of cybercrime which people may face in daily life, especially among the people of India. I also want to give different methods to be safe against these cybercrime threats and also how to identify these threats. A secure digital space can only be achieved through collective efforts, blending personal responsibility, advanced technological tools, and effective legal systems. By staying vigilant, informed, and proactive, we can significantly reduce the risks associated with cybercrime and create a safer internet for everyone.

Keywords: *Cybercrime, tools, risk, safe internet*

Smart Security : The Impact of AI and ML on Modern Threat Detection

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Abstract:

The influence of AI and ML on cybersecurity is profound, as increasingly sophisticated hackers render traditional security methods insufficient for protecting sensitive information and data. This is where artificial intelligence (AI) and machine learning (ML) come into play, revolutionizing the field of cyber security. By using the power of AI and ML, organizations can better defend themselves against cyber threats and safeguard their important data and assets. These technologies enable real-time threat detection, improved security measures, and proactive responses to potential attacks. Adopting these advancements is essential in today's digital world, where cybercriminals are constantly evolving their strategies. Staying ahead with AI and ML ensures a safer and more resilient cybersecurity framework for protecting critical information.

Keywords : *Artificial Intelligence, Cybersecurity, Machine Learning*

Big Data Analytics : Enhancing Decision-Making and Future Forecasting Abilities

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Abstract:

Big data refers to collection of vast and complex data which struggle to be process by traditional data processing tools. It involves structured, semi-structured and unshaped data. Big data contains data from numerous sources which is collected and analyze to get better insights and decision-making. Analytics is a process of examining data to find pattern, values which is use for decision making. The data which is going to process can be damage if proper security is not given to it. There is a deficit of skill professionals in these fields which organizations struggles to find necessary talent. Big data analytics is a analytical tool that enables associations to use the power of big data, which help them for decision making and future predictions.

Keywords : *Big data, Analytics, Decision Making.*

Acknowledgement : Dr. Yatinkumar K. Solanki (yatin.solanki@yahoo.com) (Asst. Professor, Dolat-Usha Institute of Applied Sciences and Dhiru-Sarla Institute of Management & Commerce, Valsad)

Data-Driven Strategies for Business Growth: Harnessing the Power of Data

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Abstract

Over time, when innovations have been relying upon data, it has become a necessity to implement data-driven strategies to emulate and elevate growth. This article discovers how data can improve decision-making, streamline processes, and provide individualized consumer experiences. It also dives into the key components of data-driven strategies, including data collection, analysis, departmental integration, and the establishment of quantifiable KPIs while concentrating on the importance of compliance and data security. Real-world applications such as dynamic pricing, predictive analytics, and customized marketing show how valuable it is to make use of data insights.

Additionally, the article offers practical solutions to promote a data-driven culture while addressing challenges including data silos, quality problems, and change resistance. Looking into the future, it emphasizes the expanding significance of AI and big data in constructing future strategies and enabling companies to prosper in a rapidly evolving digital environment. Therefore, it acts as a manual for all those businesses that plan to use data to foster innovation and growth.

Keywords: Data-driven strategies, Business Growth, Decision-making, AI

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Issues and Limitation of Black-Box Models: A Review on Explainable Artificial Intelligence

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Abstract

Recent years have seen a extremely more use in ai based methodological development in a domains majority of these models are inherently complex and lacks explainable of the decision-making process causing these models to be termed as black box any situation where work is delayed to adopt such models in mission-critical application domains such as banking e-commerce healthcare and public services safety is the difficulty in interpreting them due to the rapid growth of these ai models explaining their learning and decision-making process are getting harder which require transparency and easy predictability to reduce false negative and false positive outcomes of these back-box models finding flaws in them is still difficult and inefficient towards the end it highlights emerging and critical issues pertaining to xai research to showcase major model-specific trends for better explanation enhanced transparency and improved prediction accuracy keywords machine learning xai black-box models interpretability transparency responsible ai

Keywords: *Machine learning · XAI · Black-box models · Interpretability · Transparency. Responsible AI*

Investor Perception Towards Mutual Fund with Special Reference to Surat City

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Abstract:

This study explores investor perceptions toward mutual funds, focusing specifically on the Surat region. The research investigates how demographic factors such as gender, marital status, education, age, occupation, annual income, annual savings, and residential area influence mutual fund investment preferences. Utilizing ANOVA analysis, the study reveals significant correlations between these demographic variables and investor perceptions toward mutual funds. The results highlight that demographic characteristics substantially impact investment decisions, underscoring the necessity for customized marketing approaches and targeted financial education that address the diverse needs and preferences of different demographic segments. This research emphasizes the value of understanding the specific demographic profile of Surat's population to create more effective, investor-centric financial products and services.

Keywords : *Demographic factors, mutual fund, investment preferences.*

Introduction to Data Mining

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Abstract:

Data Mining is a model of Artificial Intelligence, is certainly one of a number of analytical gear for analyzing records units in Data Warehousing to find out styles of hobbies. Data Mining is the technique of studying statistics from one-of-a-kind prospective and summarizing it into useful information that may be used to growth revenue, cut value or each. It has inside the essential been used to investigate business corporation, medical.

Key Words : *Data, KDD, Data Warehouse, Data Mart, CRM.*

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Data Mining Technique used in Predictive Analystics

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Abstract:

Data mining has become more popular and useful in day to day life. All small, medium and large businesses want accurate data about their customer, product, and share detail. Data mining is beneficial for mining our large dataset and got useful predictable data after data mining. Before entering the world of data mining, all use different predictions for their business and they also got the best result some time and they archive their goal but sometimes have to face failure. If we analyse current scenario of data mining, there are different techniques and methods for data mining. In the market, open-source data mining tools are also available. In tools different techniques used for mine, our data and get useful data. Many tools give users a list of procedures for mine our data, and if we choose the best and most helpful technique for our dataset, they provide better results compared to other methods. In this paper, we discuss different techniques of data mining used in predictive analytics.

Keywords: Data Mining, Data Mining technique, predictive analytics.

A Comparison of Weka and RapidMiner

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Abstract:

In the world of the internet, most import is how we get useful, relevant, and accurate data. For identification of significant differences in sets of data represent frequent data mining application. If comparing with the current scenario, available data mining tools continues to grow. Data mining used to find relations between different data elements, entities, or events. If we use various tools for mining our data sets and get the best result of data. It allows organizations to create active, knowledgeable, and decision making data. For the best result of data mining, a comparison of mining tools becomes essential. In this paper, we have focus on a comparison of data mining tool Weka and RapiMiner. There are be various criteria for comparing different tools of data mining. This paper analyzes some of the main useful rules of data mining tool Weka and RapidMiner.

Keywords: Data Mining, Data Mining tool, tool selection.

An E-Commerce Design Program for the Digital Creative Industry Centered on Intangible Assets

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Abstract

Creative Industries are indeed the industries that optimize competency transformation and, maybe most importantly, individual intellectual properties, into economic values through creativity, skills, and talent. Based on the intensity of resources and products used to create or deliver value, the creative industry could be categorized into tangible sectors and intangible sectors. Tangible creative industries produce a physically tangible product, such as fashion, architectures, crafts, and printing and publishing sectors, while intangible creative industries involve a non-physically tangible product or digital product, such as music, film, movies, television and radio content, software, interactive games, digital design, and many more. Creative industries usually turns on transforming individual creativity to economic value. In the past few decades, the rapid improvement of information and communication technology translated also in a very fast growth of creative industries. This study shows how almost all processes in the value chain of the creative industry, which include: creation, production, distribution, and commercialization, are supported by ICT. Indeed, creative industries do not merely tend to find, create, and produce new ideas and products. These new ideas and products have to be distributed and commercialized for them to generate economic added values. As for the types of creative industries products, intangible products or digital goods normally require special management due to the characteristics. For example, in the digital goods market, there is no need for physical delivery to the customer, since he can download it directly after payment has cleared. With regard to stock, the digital content possesses an eternal

property, and it can be sold and delivered to customers indefinitely. Design Using ICT in a Distribution and Commercialization of a digital platform to avail e-commerce quest possible satisfaction for both the seller and the buyer transactionally.

Keywords : *E-commerce, intangible distribution and advertising, electronic assets, Creative industry.*

Financial Distress Analysis of Selected Indian Public Sector Undertakings- Special Reference to Oil Sector

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Abstact:

This paper attempt to analyse the financial distress of selected Indian Public Sector Undertakings. For the analysis Altman Z score technique, financial ratios and statistical tools have been used. Five Indian PSUs under the ministry of Ministry of Petroleum and Natural Gas i.e., BPCL, HPCL, IOCL, ONGC and OIL were selected for this present study based on convenient sampling method. The data has been collected from the concern company's annual reports for the period of last five year from 2019-20 to 2023-24. This paper examines the financial distress risk for the selected companies. The findings indicate BPCL and ONGC company falls in the "safe zone," indicating a stable financial condition, while the remaining four companies HPCL, IOCL, and OIL are classified in the "grey zone" indicating a moderate risk of financial distress. Hence, there is the urgent need for the management of the company to examine and reduce the financial distress to ensure long-term financial stability and performance.

KEY WORDS: Altman Z score model, Indian Public Sector Undertakings, Oil sector, Financial Distress

The *Pathway of Progress* conference proceedings captures the highlights of two groundbreaking events held on January 11th and 12th, 2025: the "Advancing Future Transformation of Business, Industry, and Society" conference (AFTBIS-2025) and the "Microbial Biotechnology: Pioneering Green Solutions for Global Challenges" conference (MBPGSGC-2025). Together, these parallel conferences offer a unique platform for exploring the intersection of technology, sustainability, and science.

The AFTBIS-2025 conference delved into the transformative impact of Artificial Intelligence, Data Science, Semiconductors, Cybersecurity, and other emerging technologies, shaping the future of industries and societies. Meanwhile, the MBPGSGC-2025 focused on microbial biotechnology as a key solution to environmental challenges, including climate change, waste management, and sustainable agriculture.

Through collaborative discussions, the synergies between cutting-edge technologies and sustainable biotechnology were explored, revealing new opportunities for addressing global challenges through innovation.

Dr. Snehal K Joshi
(Chief Editor)

Dr. Snehal K Joshi is chief editor of this conference proceeding book possess his degree in Computer Engineering field from NIT. He pursued his master's degree in Information Technology and Ph.D. in the field of Image processing. He is having nine years of corporate and 25 years of academics' experience at Undergraduate and Post-Graduate level. Dr. Snehal K Joshi served as Dean of Computer Science Faculty of Veer Narmad South Gujarat University (State University) for six years. He also served as syndicate and senate member of the Veer Narmad South Gujarat University, Surat. He has contributed a lot in development of several curriculums and syllabus for the University as member of academic council for thirteen years and member of Board of studies for over 20 years. He is Department Head of Computer Science and Application and Institute Head of Dolat-Usha Institute of Applied Sciences and Dhiru-Sarla Institute of Management & Commerce, Valsad. He is member of research advisory board of three Universities. He has written thirteen books out of which eleven are technical books. His 12 research papers are published in various international and national journals. He has authored several book chapters published by various publishers including CRC Press.

Dr. Hetal Panchal
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Dr. Hetal Panchal is co-editor of this conference proceeding book. She possesses her Master Degree in Microbiology subject and Ph.D. in Microbiology specialization. She is a true academician having more than 20 years of teaching experience at Dolat-Usha Institute of Applied Sciences and Dhiru-Sarla Institute of Management & Commerce, Valsad affiliated to Veer Narmad South Gujarat University. She is Department Head of the Microbiology at present. She has contributed in academics by presenting and publishing several research papers and guiding Ph.D. research scholars.

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