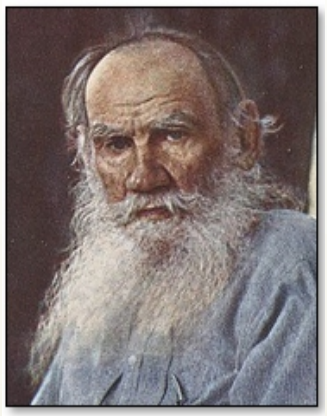
May, 2024 Vol. 3, No. 5

Dayalbagh Educational Institute (Deemed to be University)

DEI MONTHLY NEWS

"There is one thing, and only one thing, in which it is granted to you to be free in life, all else being beyond your power: that is to recognise and profess the truth."



— Leo Tolstoy

SECTIONS

Section A	:	DEI	3
Section B	:	DEI-ODE (Online & Distance Education)	7
Section C	:	DEI Alumni (AADEIs & AAFDEI).....	11

DAYALBAGH EDUCATIONAL INSTITUTE
(DEEMED TO BE UNIVERSITY)
DAYALBAGH, AGRA- 282005

CONTENTS

Section A : DEI

1. University of Edinburgh Extends MoU with DEI……..... 3

2. Delegates from the University of Glasgow, Scotland, UK, Visit DEI..... 4

3. Diamond Jubilee Memorial Lecture Organized..... 5

Faculty News

4. Faculty of Science..... 5
Staff News..... 5

Faculty of Social Sciences

5. Student's Achievements..... 6

Section B: DEI-ODE (Online & Distance Education)

6. From the Coordinator's Desk……..... 7

7. India's Undereducated Young..... 9

8. News from The Centres…….....……...…..... 10
Invited Lecture Organized at DEI Information Centre, Karol Bagh....……..... 10

Section C: DEI Alumni (AADEIs & AAFDEI)

9. From the Editor's Desk…….....… 11

10. AI and Analog Computing..... 11
Anurag Sharma

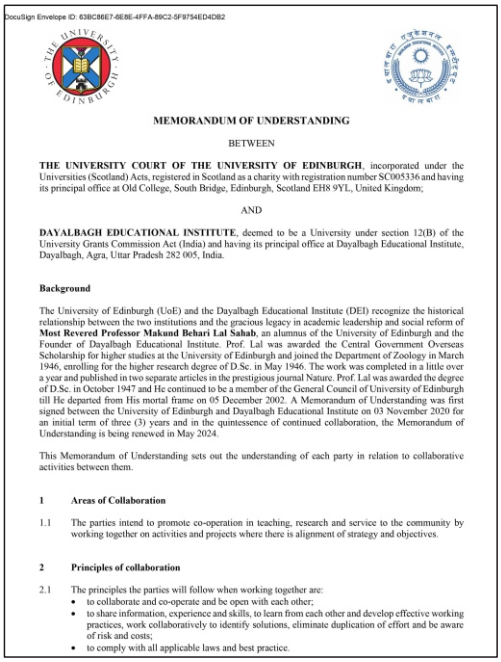
11. AI & Analog Computing: Scaling New Heights..... 12
Aadhar Bhatia

12. Greener AI: Embracing Analog Computing 13
Sree Prabha S

News Committees..... 14

Section A : DEI

University of Edinburgh Extends MoU with DEI



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MEMORANDUM OF UNDERSTANDING

BETWEEN

THE UNIVERSITY COURT OF THE UNIVERSITY OF EDINBURGH, incorporated under the Universities (Scotland) Acts, registered in Scotland as a charity with registration number SC005336 and having its principal office at Old College, South Bridge, Edinburgh, Scotland EH8 9YL, United Kingdom;

AND

DAYALBAGH EDUCATIONAL INSTITUTE, deemed to be a University under section 12(B) of the University Grants Commission Act (India) and having its principal office at Dayalbagh Educational Institute, Dayalbagh, Agra, Uttar Pradesh 282 005, India.

Background

The University of Edinburgh (UoE) and the Dayalbagh Educational Institute (DEI) recognize the historical relationship between the two institutions and the gracious legacy in academic leadership and social reform of **Most Revered Professor Makund Behari Lal Sahab**, an alumnus of the University of Edinburgh and the Founder of Dayalbagh Educational Institute. Prof. Lal was awarded the Central Government Overseas Scholarship for higher studies at the University of Edinburgh and joined the Department of Zoology in March 1946, enrolling for the higher research degree of D.Sc. in May 1946. The work was completed in a little over a year and published in two separate articles in the prestigious journal Nature. Prof. Lal was awarded the degree of D.Sc. in October 1947 and He continued to be a member of the General Council of University of Edinburgh till He departed from His mortal frame on 05 December 2002. A Memorandum of Understanding was first signed between the University of Edinburgh and Dayalbagh Educational Institute on 03 November 2020 for an initial term of three (3) years and in the quintessence of continued collaboration, the Memorandum of Understanding is being renewed in May 2024.

This Memorandum of Understanding sets out the understanding of each party in relation to collaborative activities between them.

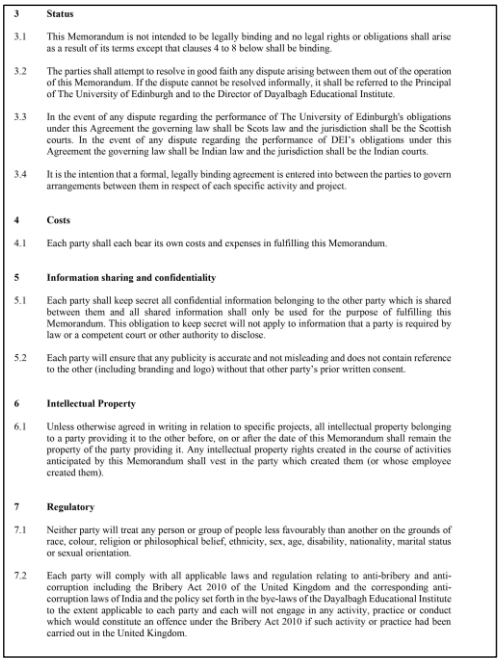
1 Areas of Collaboration

1.1 The parties intend to promote co-operation in teaching, research and service to the community by working together on activities and projects where there is alignment of strategy and objectives.

2 Principles of collaboration

2.1 The principles the parties will follow when working together are:

- to collaborate and co-operate and be open with each other;
- to share information, experience and skills, to learn from each other and develop effective working practices, work collaboratively to identify solutions, eliminate duplication of effort and be aware of risk and costs;
- to comply with all applicable laws and best practice.



3 Status

3.1 This Memorandum is not intended to be legally binding and no legal rights or obligations shall arise as a result of its terms except that clauses 4 to 8 below shall be binding.

3.2 The parties shall attempt to resolve in good faith any dispute arising between them out of the operation of this Memorandum. If the dispute cannot be resolved informally, it shall be referred to the Principal of The University of Edinburgh and to the Director of Dayalbagh Educational Institute.

3.3 In the event of any dispute regarding the performance of The University of Edinburgh's obligations under this Agreement the governing law shall be Scots law and the jurisdiction shall be the Scottish courts. In the event of any dispute regarding the performance of DEI's obligations under this Agreement the governing law shall be Indian law and the jurisdiction shall be the Indian courts.

3.4 It is the intention that a formal, legally binding agreement is entered into between the parties to govern arrangements between them in respect of each specific activity and project.

4 Costs

4.1 Each party shall each bear its own costs and expenses in fulfilling this Memorandum.

5 Information sharing and confidentiality

5.1 Each party shall keep secret all confidential information belonging to the other party which is shared between them and all shared information shall only be used for the purpose of fulfilling this Memorandum. This obligation to keep secret will not apply to information that a party is required by law or a competent court or other authority to disclose.

5.2 Each party will ensure that any publicity is accurate and not misleading and does not contain reference to the other (including branding and logo) without that other party's prior written consent.

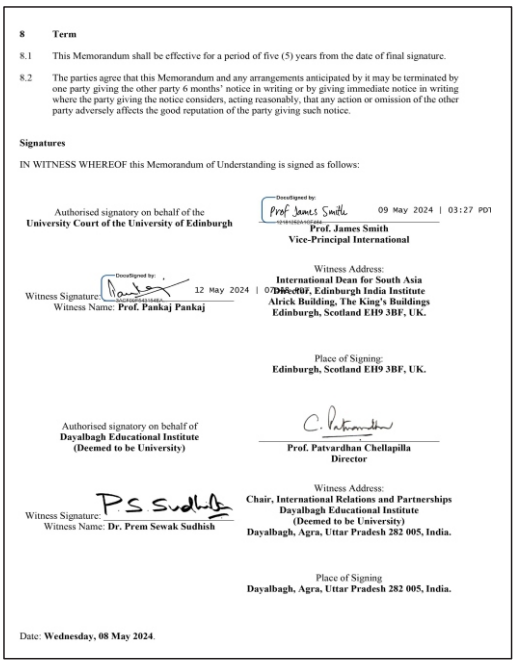
6 Intellectual Property

6.1 Unless otherwise agreed in writing in relation to specific projects, all intellectual property belonging to a party providing it to the other before, on or after the date of this Memorandum shall remain the property of the party providing it. Any intellectual property rights created in the course of activities anticipated by this Memorandum shall vest in the party which created them (or whose employee created them).

7 Regulatory

7.1 Neither party will treat any person or group of people less favourably than another on the grounds of race, colour, religion or philosophical belief, ethnicity, sex, age, disability, nationality, marital status or sexual orientation.

7.2 Each party will comply with all applicable laws and regulation relating to anti-bribery and anti-corruption including the Bribery Act 2010 of the United Kingdom and the corresponding anti-corruption laws of India and the policy set forth in the bye-laws of the Dayalbagh Educational Institute to the extent applicable to each party and each will not engage in any activity, practice or conduct which would constitute an offence under the Bribery Act 2010 if such activity or practice had been carried out in the United Kingdom.



8 Term

8.1 This Memorandum shall be effective for a period of five (5) years from the date of final signature.

8.2 The parties agree that this Memorandum and any arrangements anticipated by it may be terminated by one party giving the other party 6 months' notice in writing or by giving immediate notice in writing where the party giving the notice considers, acting reasonably, that any action or omission of the other party adversely affects the good reputation of the party giving such notice.

Signatures

IN WITNESS WHEREOF this Memorandum of Understanding is signed as follows:

Authorised signatory on behalf of the **University Court of the University of Edinburgh**

DocuSigned by: Prof James Smith 09 May 2024 | 03:27 PDT

Prof. James Smith
Vice-Principal International

Witness Signature:
Witness Name: **Prof. Pankaj Pankaj**

12 May 2024 | 07:56 PDT

Witness Address:
International Dean for South Asia
Director, Edinburgh India Institute
Alrick Building, The King's Buildings
Edinburgh, Scotland EH9 3BF, UK.

Place of Signing:
Edinburgh, Scotland EH9 3BF, UK.

Authorised signatory on behalf of
Dayalbagh Educational Institute
(Deemed to be University)

Prof. Patvardhan Chellapilla
Director

Witness Signature: P.S. Sudhish
Witness Name: **Dr. Prem Sewak Sudhish**

Witness Address:
Chair, International Relations and Partnerships
Dayalbagh Educational Institute
(Deemed to be University)
Dayalbagh, Agra, Uttar Pradesh 282 005, India.

Place of Signing
Dayalbagh, Agra, Uttar Pradesh 282 005, India.

Date: **Wednesday, 08 May 2024**.

The University of Edinburgh, Edinburgh, United Kingdom and Dayalbagh Educational Institute (Deemed to be University), Dayalbagh, Agra-282005, UP, India, have signed a renewal of the Memorandum of Understanding (MoU) for a five-year term in May 2024. The University of Edinburgh and Dayalbagh Educational Institute share a special historical relationship, as noted towards the beginning of the signed agreement:

"The University of Edinburgh (UoE) and the Dayalbagh Educational Institute (DEI) recognize the historical relationship between the two institutions and the gracious legacy in academic leadership and social reform of **Most Revered Professor Makund Behari Lal Sahab**, an alumnus of the University of Edinburgh and the Founder of Dayalbagh Educational Institute. Prof. Lal was awarded the Central Government Overseas Scholarship for higher studies at the University of Edinburgh and joined the Department of Zoology in March 1946, enrolling for the higher research degree of D.Sc. in

May 1946. The work was completed in a little over a year and published in two separate articles in the prestigious journal Nature. Prof. Lal was awarded the degree of D.Sc. in October 1947 and He continued to be a member of the General Council of the University of Edinburgh till He departed from His mortal frame on 05 December 2002. A Memorandum of Understanding was first signed between the University of Edinburgh and Dayalbagh Educational Institute on 03 November 2020 for an initial term of three (3) years, and in the quintessence of continued collaboration, the Memorandum of Understanding is being renewed in May 2024."

Delegates from the University of Glasgow, Scotland, UK, Visit DEI

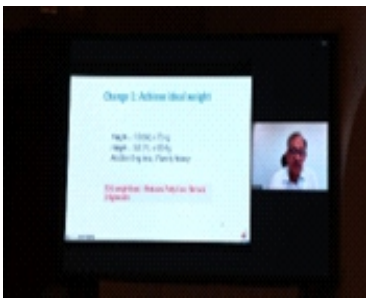
On April 21st, 2024, Mrs. Helen Martin, Dr. Joyce Nicholson, and Ms. Janette Devlin from the School of Education, at the University of Glasgow in Scotland, UK, led a team of 17 people to visit DEI. The University of Glasgow has been ranked as one of the top 20 universities in the world for sustainability as per QS Sustainability Ranking 2023. Ms. Shruti Priya, Programme Officer, and Mr. C. S. Joshi, Manager of Facilities, and Knowledge Management for Participatory Research in Asia (PRIA), New Delhi, accompanied the group. The team visited the Free Integrated Medical and Rural Assistance Camp held every Sunday. The Camp offers services to underprivileged individuals residing in the neighbouring rural community. The dedicated staff, students, and doctors of Dayalbagh Educational Institute, along with the members of the Dayalbagh Community, work together to ensure that the beneficiaries receive the best care possible. The team witnessed the various multi-speciality medical facilities being provided to the rural community. They had the opportunity to interact with physicians, radiologists, eye specialists, child specialists, physiotherapists, gynaecologists, and surgeons who offered their services free of cost. Patients were also given free medicines.

Additionally, the Visitors expressed their admiration for the efforts being made through the Hole-in-the-Wall Programme in equipping children with fundamental computer skills in line with the government's digitalization initiative. The programme also provides English language training to improve communication skills and engage the visiting children in recreational activities that boost physical and cognitive development through play-based learning. Nutritious meals and milk are supplied to the children to support their overall health, while counselling sessions promote healthy eating habits and hygiene. The visiting team was immensely impressed by the Institute's commitment to fostering the physical and mental well-being of the locals through their daily exercise and cultural activities.

The Visiting Delegation was also apprised of the vocational training opportunities for women and girls, including courses in sewing, textile printing, soft toy creation, and food processing and preservation.

One of the highlights of their visit to Dayalbagh Educational Institute was experiencing the vibrant and disciplined community life and work ethic. The Institute's impressive infrastructure, which includes agriculture, education, and industry, serves as the foundation for impactful social work in the surrounding villages, all while preserving the rich traditions of Indian culture. During their visit, they had the opportunity to speak with the Institute's Officiating Director, Prof. C. Patvardhan, and gain insight into the various community development initiatives that the Institute is involved in. The visit was organized by Prof. Jyoti Gogia, Coordinator, Dayalbagh Knowledge for Change (K4C) Hub, Prof. Rupali Satsangi, and Dr. Sona Dixit, Mentors, Dayalbagh (K4C) Hub. Dr. Suneshwar Prasad, NSS Coordinator also contributed significantly towards organizing the visit.

Diamond Jubilee Memorial Lecture Organized



On May 9th, 2024, another edition of the Prestigious DEI Diamond Jubilee Memorial Lecture Series was organized at the Convocation Hall of the Institute. The distinguished speaker of the event was Padma Bhushan Dr. S.K. Sarin, Chancellor of the Institute of Liver and Biliary Sciences, New Delhi. Approximately 15,000 people from around the world attended the lecture, either in person or online. Distinguished attendees included Most Revered Prof. P.S. Satsangi, Chairman, Advisory Committee on Education (a non-statutory body serving as a think tank for Dayalbagh Educational Institutions), Most Respected Rani Sahiba ji, Shri Gur Swaroop Sood, President, DEI, Prof. Prem Kumar Kalra, Senior Director, DEI, Prof. C Patvardhan, Officiating Director, DEI, Prof. Anand Mohan, Registrar, DEI, and Mrs. Sneh Bijlani, Treasurer, DEI, alongside other guests, faculty members, students, and alumni of DEI. The programme began with the Institute prayer, followed by a brief introduction of the DEI Diamond Jubilee Memorial Lecture Series by Prof. Anand Mohan.

Dr. Sarin commenced the lecture by delving into the topic of liver health, shedding light on the widespread prevalence of Non-alcoholic fatty liver disease (NAFLD) among the population. He highlighted the adverse effects of excessive liver fat, connecting it to inflammation and various health complications, such as diabetes and cardiovascular diseases. Throughout the discussion, the critical role of liver function in regulating blood glucose levels and its overall impact on well-being remained prominent. The lecture expanded to cover a wide range of treatment options for NAFLD, including lifestyle modifications, pharmacotherapy, and surgical interventions. In conclusion, the focus shifted to policy initiatives and the commendable efforts of the Dayalbagh Educational Institute in addressing NAFLD on a national scale. Suggestions were made regarding raising awareness and promoting self-assessment and self-regulation strategies to mitigate liver dysfunction. Dr. Sarin advocated for collective community efforts to prevent and manage NAFLD effectively.

Subsequent remarks from the Most Revered Prof. P.S. Satsangi highlighted the importance of dissolved oxygen levels and the potential of homoeopathic interventions in maintaining well-being. He emphasized the significance of regular monitoring encompassing blood pressure, dissolved oxygen, and weight to uphold systemic equilibrium. Overall, the lecture was well-received and deemed a significant success in disseminating awareness about liver health among the masses. After the lecture, Dr. Amla Chopra, Assistant Professor, Department of Zoology, DEI, proposed a formal Vote of Thanks, and the Programme concluded with the University Song. The programme was compered by Prof. Sumita Srivastava, Department of Management, DEI.

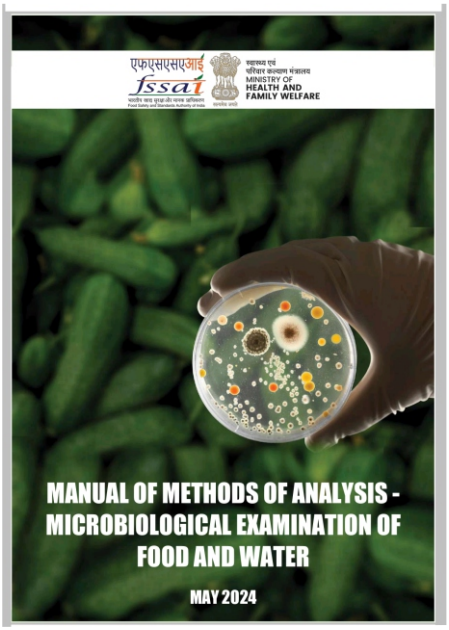
Faculty News

Faculty of Science

Staff News:

Dayalbagh Educational Institute has contributed for the third time in developing a National Reference Manual for the analysis of food. The latest is the 'Manual of Methods of Analysis- Microbiological Examination of Food and Water' published by the Food Safety and Standards Authority of India (FSSAI), Ministry of Health and Family Welfare, Govt. of India in which Dr Prem Saran Tirumalai, Asst. Prof. Department of Botany, DEI, has contributed as an expert. This Manual was released on

17th May 2024. Dr Prem Saran also contributed to the earlier two National Reference Manuals (Manual of Methods for Milk and Milk Products and General Guidelines on Sampling for Microbiological Analysis) in 2022.



LIST OF CONTRIBUTORS

Dr. Kiran N. Bhilegaonkar
Principal Scientist, ICAR-Indian Veterinary Research Institute Regional Station, Pune

Dr. Rajan Sharma
Principal Scientist, ICAR-National Dairy Research Institute, Karnal

Dr. Satyen K Panda
Advisor (Quality Assurance), Food Safety and Standards Authority of India

Dr. Ajit Dua
Chief Executive Officer, Punjab Biotechnology Incubator, Mohali

Dr. Geetanjali Sharma
Director, National Food Laboratory, Kolkata (FSSAI)

Mr. Amit Agarwal
Assistant Scientific Officer, Punjab Biotechnology Incubator, Mohali

Dr. Raghu H.V.
Scientist, ICAR-National Dairy Research Institute, Karnal

Dr. Prem Saran Tirumalai
Assistant Professor, Dayalbagh Educational Institute, Dayalbagh, Agra

Dr. Prakash Gupta
Technical Officer, Export Inspection Agency, Chennai

Dr. Maheshwar Rao
Assistant Director, Export Inspection Agency Kochi

Dr. Anoop Krishnan
Assistant Director, Export Inspection Agency, Kochi

Ms. Sweety Behera
Director, Food Safety and Standards Authority of India

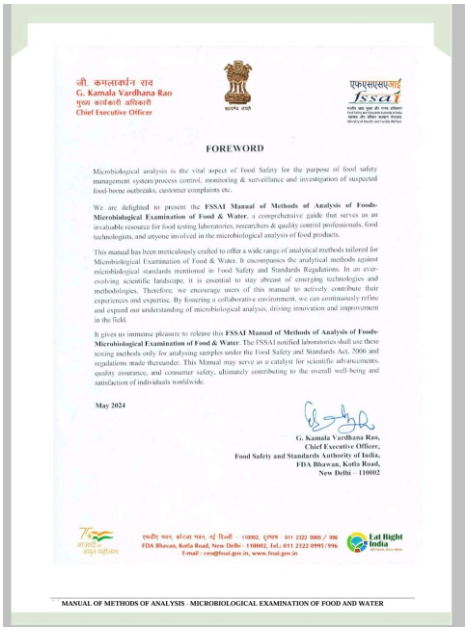
Mr. Balasubramanian K
Joint Director, Food Safety and Standards Authority of India

Dr. Dinesh Kumar
Assistant Director (Tech.), Food Safety and Standards Authority of India

Ms. Gurpreet Kaur
Technical Officer, Food Safety and Standards Authority of India

Ms. Priyanka Meena
Technical Officer, Food Safety and Standards Authority of India

MANUAL OF METHODS OF ANALYSIS - MICROBIOLOGICAL EXAMINATION OF FOOD AND WATER



जी. कमलावर्धन राव
G. Kamala Vardhana Rao
मुख्य कार्यकारी अधिकारी
Chief Executive Officer

FOREWORD

Microbiological analysis is the vital aspect of Food Safety for the purpose of food safety management system process control, monitoring & surveillance and investigation of suspected food-borne outbreaks, customer complaints etc.

We are delighted to present the **FSSAI Manual of Methods of Analysis of Foods-Microbiological Examination of Food & Water**, a comprehensive guide that serves as an invaluable resource for food testing laboratories, researchers & quality control professionals, food technologists, and anyone involved in the microbiological analysis of food products.

This manual has been meticulously crafted to offer a wide range of analytical methods tailored for Microbiological Examination of Food & Water. It encompasses the analytical methods against microbiological standards mentioned in Food Safety and Standards Regulations. In an ever-evolving scientific landscape, it is essential to stay abreast of emerging technologies and methodologies. Therefore, we encourage users of this manual to actively contribute their experiences and expertise. By fostering a collaborative environment, we can continuously refine and expand our understanding of microbiological analysis, driving innovation and improvement in the field.

It gives us immense pleasure to release this **FSSAI Manual of Methods of Analysis of Foods-Microbiological Examination of Food & Water**. The FSSAI notified laboratories shall use these testing methods only for analysing samples under the Food Safety and Standards Act, 2006 and regulations made thereunder. This Manual may serve as a catalyst for scientific advancements, quality assurance, and consumer safety, ultimately contributing to the overall well-being and satisfaction of individuals worldwide.

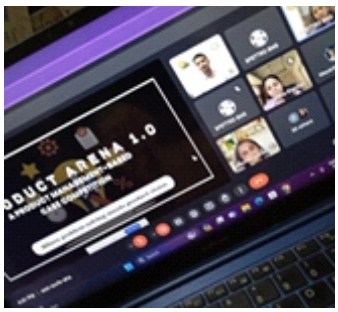
May 2024

G. Kamala Vardhana Rao,
Chief Executive Officer,
Food Safety and Standards Authority of India,
FDA Bhawan, Kotla Road,
New Delhi – 110002

MANUAL OF METHODS OF ANALYSIS - MICROBIOLOGICAL EXAMINATION OF FOOD AND WATER

Faculty of Social Sciences

Student's Achievements:



Ami Shrivastava, a Second-year BBA student, secured the title of National Winner in 'Product Arena 1.0', a National Case-Study Competition organized by Deen Dayal Upadhyaya College (DDUC), Delhi University. Product Arena is a Product Management Competition in which the contestants were judged in three rounds: Quiz, PPT Submission, and Presentation. They were given a case to resolve the problems of WhatsApp Payments and revamp the platform. Ami earned extra points and praise from the jury for being the only solo entry and for her UI/UX designs of the new product feature. The jury included Mr Mayank Agarwal, Director of Growth & Product at Urban Company (formerly UrbanClap). The Competition attracted talent from top colleges including IIM Indore, IIT Kanpur, and IIM Rohtak, competing for the title of National Winner and a cash reward.

Ami also secured the Second Runners-Up position in 'Finshots Forage: A National Case-Study Competition' by BITS Pilani X Finshots. Finshots is India's largest financial newsletter, read by over 500,000 readers every day. The contestants were asked to revamp Finshots' content in this competition and formulate an 8-month growth strategy. This Competition attracted talent from all over the country, with many Business Schools, like, IIM Udaipur, NMIMS, and IIM Bangalore, providing a great networking opportunity to the participants. Ami also secured merchandise and an internship interview with the company as a reward.

Section B: DEI-ODE (Online & Distance Education)

From the Coordinator's desk

It is a moment of great rejoicing for us and our community as we witness and welcome the launch of the book entitled 'Role of Communities in Achieving Sustainable Development' by Revered Prof. Prem Saran Satsangi and Dr. Arsh Dhir. It is truly a milestone and some highlights from the book will be presented here.

To begin from the beginning, an event of great significance for the world was the adoption of the following seventeen Sustainable Development Goals (SDGs) by all United Nations member States in the year 2015 as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by the year 2030.

1) No Poverty	7) Affordable Clean Energy	11) Sustainable Cities & Communities
2) Zero Hunger	8) Decent Work & Economic Growth	12) Responsible Consumption & Production
3) Good Health & Well-Being	9) Industry Innovation & Infrastructure	13) Climate Action
4) Quality Education	10) Reduced Inequalities	14) Life Below Water
5) Gender Equality		15) Life on Land
6) Clean Water & Sanitation		16) Peace Justice & Strong Institutions
		17) Partnership for the Goals

Sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

The three-pillar model is generally used to provide a common description of sustainability. The three pillars are environmental, social and economic. Environmental sustainability focuses on water quality, air quality, climate action and biodiversity and seeks to sustain the global life support system indefinitely. Social sustainability is about making sure that communities and societies can thrive and continue to exist in a healthy, fair and equal way. It focuses on improving people's quality and life fostering strong relationships and ensuring everyone has the chance to fulfil their potential. Social sustainability has a number of constituent elements including social homogeneity, equitable incomes and access to goods, services and employment. It encompasses quality education, good healthcare, gender equality and reduced inequality. Some sustainable aspects that social sustainability aims to address include basic needs such as food, housing and income and extended needs such as recreation, self-fulfilment, inter and intra-generational justice along gender, race, class, and ethnicity dimensions, fair distribution of income, fair distribution of environmental 'bads' and 'goods', equality of rights including human rights, land use and tenure rights, and indigenous peoples' rights, and access to social infrastructure, etc.

Economic sustainability is the economic aspect of sustainable development without impacting the environment or surrounding communities. It promotes economic growth, employment, sustainable

consumption and production, innovation and food security without negatively impacting social and environmental aspects of the economy.

The 17 SDGs listed earlier are interlinked, i.e. they recognize that action in one area will affect outcomes in others, and that development must balance social, economic and environmental sustainability.

The book traces the progress towards achieving the SDGs and notes that this has either slowed, halted or reversed in recent years at the global, national (India) and state levels. The authors therefore discuss the need for a new framework for sustainable development. In the conventional three-pillar model of sustainability, the "pillars" cannot be viewed as independent constructs. It is not possible to isolate human development from environmental development, as agricultural activities that involve the destruction of ecosystems can lead to the loss of natural resources like wood, food, and medicines.

Considerations like this led to the development of an augmented framework for attaining sustainability which encompasses "both inner and outer divisions of this crucial Trinity (viz. Environmental, Social and Economic). Thus the underlying inner dimension of sustainability is expected to render Yeoman's service in fulfilling the impact of the outlying dimensions.

Holistic Sustainability thus encompasses both Inner {People's Values, Beliefs, Attitudes, Intuition and Spiritual Blissfulness (as Captured by Intervening Phraseology of Mediating Artefact of Conscientiousness Between Consciousness & Awareness)} and External Dimensions (Environmental, Social and Economic)".

It proposes that "ensuring achievement of SDGs requires underlying fundamental shift within each living being, convincingly realising the achievement of Sustainable Development at the Middle Division of the Trinity by integrating people's Consciousness at the Upper Mode-Level and Awareness at the Lower Mode-Level by invoking the artefact of Conscientiousness at the Middle Mode-Level (e.g. People's Values, Beliefs, Attitudes and Spiritual Consciousness)".

This brings us to around one-third of the book. The remaining two-thirds of the book is devoted to a very perceptive and meaningful presentation on a Case Study of Dayalbagh and how sustainable development has been achieved through the Dayalbagh Way of Life. All of us can benefit from their in-depth analysis and having understood it, ensure that their Message spreads as it is the right and practical way forward for our world.

The case study of Dayalbagh starts as follows: ……Dayalbagh is a model and novel eco-village and healthcare habitat. The way of life of the residents is summarised using the Sigma Six Q-V-A Model. The six qualities that underlie the Dayalbagh way of life and lead to a sustainable future are as follows: Agriculture (Agroecology-cum-precision farming) and Dairy; Education and Healthcare; Air Quality; Water quality and Human Values and Innovations.

Agriculture in Dayalbagh is organic and is done by using bio-fertilizers and organic manure. Multiple bio-ecosystems including crop fields, vegetable gardens, fruit orchards, fodder fields, medicinal herb gardens, and biodiversity parks co-exist in Dayalbagh.

Dayalbagh Gaushala houses a diverse bovine community of 864 cows and 206 buffaloes including males, females, and calves. The addition of 43 goats in April 2023 and 13 camels in December, 2023 further enriches its diverse herds catering to the nutritional needs of the community. The Gaushala yields approximately 1300 litres of milk daily to meet the demands of Dayalbagh and the neighbouring areas.

Starting with a co-educational middle school on Jan 1, 1917, a Technical College was set up in 1930 followed by a Women's Training College in 1947 and an Engineering College in 1950. A strong foundation was provided to our education system by the comprehensive and innovative education policy formulated by the Revered Dr. M.B. Lal Sahab whose unceasing efforts led to the founding of Dayalbagh Educational Institute (Deemed to be University) in 1981 with the mission objective of producing well-rounded complete persons. The inter-disciplinary, work-experience-based quality education which is also values-based, is imparted with very low fees and has been hailed by the statutory authorities as a role model.

The healthcare habitat of Dayalbagh promotes the health of the residents of the colony and its neighbourhood by providing free multi-speciality healthcare facilities.

Air quality and water quality are regularly monitored and steps are taken to ensure that they are as per the international regulatory framework standards.

At Dayalbagh the ethos of human values permeates every aspect of its community, particularly in the realm of caring for its differently-abled children. The spirit of service to mankind is evident in all institutions of Dayalbagh including Agroecology-cum-precision farming and educational. As explained by one of the authors, Revered Prof. P.S. Satsangi, "In our lifestyle of better worldliness, we require to awaken our True Self rather than the rule of mind, intelligence and matter alone."

The book lists several initiatives of Dayalbagh which are good examples of innovation in addition to the 1975 Education Policy described earlier. Some of these are:

- Advisory Committee on Education: It is a non-statutory think tank comprising of eminent academicians, educationists and alumni. The Committee provides visionary guidance for excellence in education across all Dayalbagh Educational Institutions. Their advice gets considered by the statutory bodies of the Institute.
- Superman Evolutionary Scheme: The Superman Evolutionary Scheme of Dayalbagh is an innovative concept where infants and children (3 weeks to 12 years) participate in congregational prayer, self-less service (seva) in fields and healthcare exercise every day at the Agroecology-cum Precision Farming sites twice a day before and after school along with a parent or care giver. The Dayalbagh way of life impacts the children and they show an accelerated rate of physical growth and also score high in intellectual, social and emotional maturity.
- Other Innovative areas listed in the book are: Consciousness studies, Women's empowerment, Renewable energy, Medical camps, Response to crisis, etc.

Finally, a full chapter is devoted to achieving Sustainable Development through Dayalbagh way of life: External and inner dimensions.

The methodology used is as follows: the study first discusses the features of each element of the Sigma Six Q-V-A Model (Dayalbagh Way of Life). It then identifies the external dimensions of sustainability for each of the qualities as well as the SDGs that the features impact. Further, for each element of the Sigma Six Q-V-A Model, the study examines how the element leads to a transformation in people's values, beliefs, attitudes, spiritual and intuitive consciousness and conscientiousness, i.e. the inner dimension of sustainability.

The ideas contained in this book will hopefully be understood by policymakers and at least some of them will be adopted or adapted all over our planet Earth. While doing this, the following quotation of Revered Sir Anand Sarup Kt. on page 115 of the book would serve as the beacon:

"Idealists have dreamt of utopia. But Dayalbagh is a fact."

(Prof. V.B. Gupta)

India's Undereducated Young

In *The Times of India* of May 13, 2024, Chetan Bhagat's article carrying the above title states that "millions of students, who have been to good schools and are going to good universities, are growing up on videos, not books. There is no big purpose, no real interest in the world or in elections." The author cites that in a recent video, the students of a private Indian university taking part in a political protest appear to be clueless as to what this protest is about. They are carrying placards but just cannot explain these. The author calls them the undereducated class of India. He adds: "It is not being said that there are no bright students in India. Our top students are amongst the world's best. But when it comes to all students, things are quite dim around the middle of the curve. Surveys indicate that more than half of Indian graduates are unemployable."

The author then goes on to state that "this too is the privileged class, where they are brought up with

relatively high resources, then why is this the case?" And he comes up with the following three 'true' reasons:

(i) The non-thinking family: Many Indian families even with means, do not encourage their children to read, write, think, analyze, opine, and solve problems. Worst is when we are on our phones even at the dining table, not engaging with our family at all. This is a breeding ground for intellectual stagnation,

(ii) The aversion to reading: Watching videos has become the new cool and books a waste of time, and

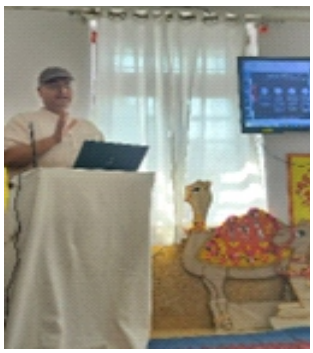
(iii) The addiction to distractions: The average Indian student wants a good life. A constant stream of content from social media leaves hardly any time to consider their life's purpose. When asked about their career goals, all they say is 'I want some nice easy job.'

Finally, the author voices his strong concerns and offers some advice as follows: "There is no focus, passion, or desire to make a mark on the world, excel in a particular field, or build a meaningful life. Their mentality is often, 'Give me this lifestyle somehow, even if my parents indirectly subsidise it.' Please, stop! Stop being distracted by whatever is keeping you intellectually stagnant and underachieving. Learn about the world. Find your place as a productive member of society. Set challenging goals and stay focused on achieving them."

—Compiled and Collated by Prof. V.B. Gupta, Coordinator, DEI-DEP

News From the Centres

Invited Lecture Organized at DEI Information Centre, Karol Bagh



In a thought-provoking session held at the DEI Information Centre, Karol Bagh, on 19th May 2024, Mr. Samir Suri, an esteemed alumnus of the Centre, delved into the timeless debate of Analog Computing versus Digital Computing. With a wealth of experience in the Tech Industry, Mr. Suri provided illuminating insights into the strengths and nuances of both paradigms.

Mr. Suri asserted that Analog computing harkens back to the roots of computing, offering a continuous range of values for computation. Its ability to model real-world phenomena with precision and efficiency is unmatched, particularly in domains like signal processing and control systems. On the other hand, he specified that digital computing, with its discrete values and binary logic, has revolutionized the modern world. From blazing-fast calculations to complex algorithms, digital systems dominate today's technology landscape, powering everything from smartphones to supercomputers. However, as emphasized by Mr. Suri, the choice between analog and digital is not always clear-cut. Each approach has its own merits and limitations, and understanding when to leverage one over the other is the key to technological innovation.

All the Attendees left the session with a deeper appreciation for the rich tapestry of computing paradigms and the exciting possibilities they offer for the future.

Section C: DEI Alumni (AADEIs & AAFDEI)

From the Editor's desk

The fact that technology has transformed human life to a point that there is no going back, is no longer debatable. The recent advances and innovations in Artificial Intelligence (AI) have created tremendous hope and at the same time a sense of trepidation. Are we responsible enough to harness this new highly dynamic and rapidly developing technology in ways that can improve the quality of our lives? Stephen Hawking talked about the human race being superseded by AI and the dangers of AI surpassing human capabilities. Much concern has been expressed over AI rendering many jobless, but history has shown that every time there was a shift in technology more jobs were created than lost. Or can we not share Einstein's hope that eventually the human spirit must prevail over technology and even surpass it. "One thing I have learnt in a long life: that all our science, measured against reality, is primitive and childlike—and yet it is the most precious thing we have."

Please share your comments and views at aadeisnewsletter@gmail.com. Your response will be deeply appreciated.

AI and Analog Computing

Anurag Sharma

M.Sc. Physics Electronics (Batch 1990); M.Phil Comp Science (Batch 2009), DEI Previously, Head Global Business Strategy Tech Mahindra. Presently, Business Growth Consultant to Technology Companies

Artificial Intelligence or AI has reached what is called the exponential portion of the famous S-Curve of Systems Theory, being the most talked about subject for engineers, scientists and the general public at large, for the past few years. Scientists across the world, though, have been working in this field for more than 50 years.

One of the major causes for the explosion in AI use-cases in all fields has been the unprecedented growth in computing power, driven by advances in semiconductor technology or miniaturization, the most recent announcement being Cerebras Systems unveiling the world's fastest AI Chip with whopping 4 trillion transistors!

AI models, like the recent ones called LLMs or Large Language Learning Models, like GPT-4, BARD, PaLM-E require extensive training on vast datasets for optimal performance as they have become more complex. These datasets are what defines AI systems' responses and behaviour to stimulation or inputs. However, the digital computing systems supporting AI have struggled to keep pace, leading to slower training speeds, suboptimal performance, and increased energy consumption. This threatens AI's future and calls for re-evaluation of traditional computing systems.

Traditional digital computing, reliant on binary representations (0 and 1) and electronic components, have several limitations, making engineers and scientists go back to exploring Analog Computing approaches and systems for AI. The most well-known is Moore's Law, which poses a limitation on increase in computing power due to the physical limitation of fitting an even larger number of transistors on a chip. The other big issue is huge troves of energy required to run the computing or server farms for AI systems.

However, there are other limitations of Digital Computing, some of which are listed below:

- Discrete Representation and Precision Issues
- Processing Speed and Parallelism
- Von Neumann Architectural Bottleneck
- Data Conversion Overheads

Analog AI, sometimes called Neuromorphic or Brain-inspired computing, is a branch of AI and computing that draws inspiration from the structure and functioning of biological neural networks.

Analog computers are great at solving multiple complex calculations simultaneously. The capability, called parallel processing, makes analog technology ideal for applications in emerging fields like AI, quantum computing, and intelligent edge and advanced IoT. Unlike digital computing, which processes data discretely, Analog computers operate continuously. Analog AI's continuous operations or continuous data processing also consumes less power than digital AI, which also aligns with sustainability goals by minimizing the carbon footprint of AI systems.

IBM research forecasts that by 2026, Analog AI Cores with Optimized Materials could give 1000X efficiency improvement over digital AI cores, targeting a Million GFlops/Watt in the next decade! Other advantages of Analog Computing are reduced data transfer bottlenecks and in-memory data processing, because if there is no or lesser movement of data, tasks can be performed in a fraction of time and with lesser energy consumption.

The coming years within this decade itself will see exciting developments in these fields, probably hybrid Analog Digital AI systems. Keep watching the space!

AI & Analog Computing: Scaling New Heights

Aadhar Bhatia

B.Tech in Electrical Engineering (Batch 2021), DEI; Currently, Software Engineer, Keysight Technologies, Gurugram, India

For a long time now, the human race has witnessed tremendous growth leading to the best of discoveries and inventions, one unleashing the other. We went from axes and fire to language and writing and eventually industrial technologies. Around 80 years ago, we saw an explosion of mesmerizing advancements - transistors, computers, smart phones, computation and low latency communications. Today we are perhaps in the fastest and most consequential wave of technical revolution, Artificial Intelligence. In just the last 18 months, there's been a huge increase in the use of large language models leading to major breakthroughs in knowledge & information sharing.

AI has proved to be most successful in accomplishing a variety of tasks, which includes programming, math, collating information on a topic or even writing creative essays and poetry. What in the past could only be done by humans is now being done quite proficiently by computers. The simpler question that confuses many of us, is “what is AI anyway?" and there can be an intuitive and easy answer to this - AI, more or less, is a digital companion that has helped humanity be more productive and efficient. It augments the future for us through promising climate predictions, disease diagnosis, unmanned vehicles and even personalized recommendations. As a matter of fact, what makes it possible is nothing more than human contributions in the area of differential & algebraic math intertwined with a great rise in hardware technology (e.g. GPUs) that present enormous computational power. Another important factor in the success of AI is “data”. According to Forbes, 90% of the world's data has been generated in the last two years. This data

allows deep learning models (aka Neural Networks) to derive insightful patterns owing to the high computational power available and hence show promising results in prediction and analysis.

With the advent of AI, another technology which was created many years ago and had vanished, has now resurfaced--- Analog computing. This has shown highly promising results with the recent AI advancements. Analog computers are based on electric circuitry with active elements like voltage sources and passive elements like resistors, capacitors and inductors hence allowing us to perform simple as well as complex mathematical operations efficiently. This includes the ability of Analog systems to solve algebraic math, differential equations and simulate real world physical systems quite simply, with less power compared to digital systems that would probably consume hundreds of transistors to compute results for the above. In the mid 20th century, as algorithmic computing, data storage and communication protocols evolved, there was a rise of digital systems which significantly outperformed the Analog computers. However, with the recent AI developments, Analog computing has the potential to be highly useful for AI. This is due to its ability to solve algebraic and differential math very efficiently with less power. This is the math that forms the basis for any deep learning or machine learning model of AI. The potential promised by Analog computing is also evident by the study of the brain. The human brain generates just 20 watts, which is very much like a dim light bulb. Yet, it achieves results with such great accuracy which can barely be matched by supercomputers operating on thousand times more power and hardware. The difference lies in the fact that the human brain doesn't have any zeros or ones but just analog signals (voltage) that can help us perform extraordinary logic and math.

With this, it can be concluded that Analog computing and AI together can perform highly skillful tasks, solve many of the human problems and that too probably with lesser than expected power consumption and impressive accuracy levels. With these technologies being around us today, the 2020s is indeed the cradle of innovation that we hope will help humanity in the best ways possible.

Greener AI: Embracing Analog Computing

Sree Prabha S

Postgraduate Diploma in Theology (Batch 2020-21), DEI; Currently, Independent QA Analyst, IT

Artificial intelligence (AI) is about making machines smart, so they can do things that seem intelligent, like recognizing patterns and making decisions. Unlike people, AI is really good at sorting through huge amounts of data to do these tasks.

Earlier, we used Analog computers to help AI learn, like how we learn from examples. But then digital computers came along and took over because they're faster and more precise. Nowadays, we are seeing a trend towards using even bigger AI networks because we want them to handle more complex tasks.

However, there's a problem: training AI uses up a ton of energy, which is like having thousands of computers running all at once. Also, that energy comes from burning fossil fuels, which is harmful to the environment. So, to fix this, researchers at the University of Copenhagen are trying to design AI models that use less energy from the start. Plus, companies like IBM are making special Analog chips that use way less energy and still work really well.

We are not sure if Analog computing will take over from digital ones, but they're great for some of the challenges faced in AI right now. And if we can use them alongside digital computing, we might get better technology while using less energy.

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