



**In Association with**



**INTERNATIONAL CONFERENCE ON ADVANCES IN INFORMATION TECHNOLOGY AND MANAGEMENT**

# **Leveraging Information Technology for Sustainability in Agriculture & Medicine - COVID-19 Crisis**

**20 - 21 February 2021**



*Thakur Educational Trust's (Regd.)*

## **Thakur Institute of Management Studies, Career Development & Research**

**(Approved by AICTE, Govt. of Maharashtra & Affiliated to University of Mumbai)**

**ISO 9001 : 2015 Certified • MCA Program Accredited by National Board of Accreditation, New Delhi**

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# Our PEOs and POs

## PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

1. To enable students to gain knowledge across all domains of Information Technology with in-depth understanding of their applications.
2. To enable students to analyze problems and to design and develop software solutions using emerging tools and technologies.
3. To enable students to continue Life-long learning, Research and Entrepreneurial pursuit in their chosen fields.
4. To develop communication, teamwork, and leadership skills necessary to manage multidisciplinary projects and serve the society as responsible and ethical software professionals.

## PROGRAM OUTCOMES (POs)

**PO-1: Computational Knowledge** – Apply domain specific knowledge of computing and mathematics for designing of software solutions for defined problems and requirements.

**PO-2: Problem Analysis** – Understand and analyze a problem and suggest feasible solutions.

**PO-3: Design/ Development of Solution** – Design, evaluate, and develop effective solutions for complex computing problems to meet desired needs.

**PO-4: Conduct investigation of complex computing problems** – Design and conduct experiments and use research-based methods to investigate complex computing problems.

**PO-5: Modern tools usage** – Use appropriate techniques and software tools for computing activities.

**PO-6: Professional Ethics** – Understand and commit to professional norms, regulations and ethics.

**PO-7: Life long Learning** – Recognize the need for and have the ability to engage in independent learning for continual professional development.

**PO-8: Project management and finance** – Understand and apply project management principles, as a member or leader in multidisciplinary environments.

**PO-9: Communication Efficacy** – Effectively communicate technical information, both oral and written with range of audience.

**PO-10: Societal & Environmental Concern** – Analyze societal, environmental, cultural and legal issues within local and global contexts when providing software solutions.

**PO-11: Individual and Team Work** – Work as a member or leader in diverse teams in multidisciplinary environments.

**PO-12: Innovation and Entrepreneurship** – Use Innovation and Entrepreneurship for creation of value and wealth.

## VISION

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Thakur Institute of Management Studies, Career Development and Research will become a premier Institute renowned internationally for providing education in Software Application to graduates from various disciplines.

## MISSION

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To achieve excellence in providing software education so that students can grasp existing as well as emerging technologies and to inculcate leadership and managerial qualities in them so that they can deliver results in the organization they join.

## QUALITY POLICY

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We, the staff, faculty and management of Thakur Institute Of Management Studies, Career Development and Research are committed to offer excellence in software education, conducive academic environment and state-of-the-art infrastructure to our students. We work as a team and interact with students in pro-active manner to achieve our Quality Objectives and fulfill all academic, statutory and regulatory requirements to entire satisfaction of our students as well as for continual improvement of QMS.



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## Chief Patron's Message for ICAIM-2021

**D**uring the last few years, TIMSCDR, under the aegis of Thakur Education Group (TEG) has been excelling in its journey into the field of education and research of international standards. TIMSCDR, in its journey towards excellence has taken the initiative in organizing yet another International Conference 'International Conference on Advances in Information Technology and Management - Leveraging Information Technology for Sustainability in Agriculture & Medicine - COVID-19 Crisis'.

The aim of the conference is not only to create awareness about the imminent issue of waste management and make people environmentally responsible but also to understand how to gain maximum return from waste resources. Achieving environmental objectives in an increasingly competitive business climate requires access to the best and most up-to-date information available. I am sure this conference will provide a platform to progressive farmers, healthcare professionals and academicians to probe into various opportunities to design and practice an integrated and sustainable system for waste management.

I take this opportunity to congratulate the organizing committee for their dedication and hard work for successfully arranging this event. I am also very grateful to all the delegates and research scholars for sharing their research work and making this conference a huge success.

**V. K. Singh**  
Chairman



Thakur Educational Trust's (Regd.)

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## CEO's Message for ICAIM-2021

I feel privileged to welcome you all for the upcoming International Conference on Advances in Information Technology and Management titled “Leveraging Information Technology for Sustainability in Agriculture & Medicine - COVID-19 Crisis” organized by TIMSCDR, under the aegis of Thakur Education Group (TEG).

Due to tremendous increase in human population and industrial development, waste is being generated at a colossal level and managing it has become a very challenging task for the human kind. Waste management is now not about merely dumping the unwanted things in a random way it but has become a systematic process consisting of collection, transportation, and proper disposal of garbage, sewage and other waste products.

This conference, a distinctive endeavor of TIMSCDR, will provide a platform for the exchange of ideas and findings of all intellectuals from academia, industry and research institutions in the area of application of Information Technology for waste management. I am sure this exchange of ideas among eminent and erudite personalities from relevant fields will open many more avenues of future technological enhancements.

The zeal and enthusiasm with which the organizing committee has come forward is commendable. I extend my best wishes to the faculty, delegates and the organizing committee for excellence in their endeavors.

**Mrs. Karishma V Mangal**

CEO



Thakur Educational Trust's (Regd.)

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## Director's Message for ICAIM-2021

“The secret of change is to focus all your energy, not on fighting the old, but on building the new.” – Socrates. Truly the COVID-19 Virus has proved to be a change maker all across the globe. It has literally changed the way we lived and has made us move from our old Normal way to a New Normal. The Virus also examined how sustainable was the human race as it confronted the COVID-19 crisis. Several people were unable to make it due to physical health issues, materialistic losses and emotional breakdown, which took the biggest toll. ICAIM 2021 titled “Leveraging Information Technology for Sustainability in Agriculture & Medicine – COVID-19 Crisis” was opportune to understand and realize the role of Information Technology in the COVID-19 Crisis.

Even as the Institute started its preparations in March 2020, the start had to come to a partial halt due the pandemic which disrupted almost everything. The enforced lockdown made it difficult to get back to work immediately as efforts were made to switch to the online mode of working. Though we are a part of the IT domain, and quiet well versed with using technology, it took some time to normalize into the virtual mode as the only way of communication now, was Virtual. It was difficult to get in touch with Farmers and Doctors initially at the beginning of the pandemic, as these were the Front Line Warriors who were not restricted by any lockdown but had to be on the forefront ensuring that the rest of world stayed safe at home while they toiled at the fields and hospitals respectively to ensure that even during the pandemic crisis there was some peace and presence of normalcy.

ICAIM 2021 continues to focus on the leverage of Information Technology for Sustainability in general and in the domains of Agriculture and Medicine in specific. It was satisfying to understand during discussions with few Farmers, the manner in which Farmers from even the remotest part of the country were using Technology to ensure that their produce did not go waste and reached their customers on time. Many Farmers are now using online modes for selling and transacting. They are able understand the needs of their customers better as some of

them are directly dealing with the customers either through simplest technologies like Whatsapp groups or even through already available Mobile Applications. Those farmers who are unable to tackle the Technology challenge have joined hands with companies like BigBasket which has tie-ups with farmers and help them sell their produce. ICAIM 2021 was able to bring on a single platform Farmers and IT professionals to tell their success stories of how they sustained and helped sustain the nation during the COVID-19 Crisis.

TIMSCDR has been since long, in touch with the Healthcare sector. Discussions with Doctors from largest municipal hospital LTMMC & GH and our association with AMC helped us understand how the Doctors stood confident and strong fighting the COVID-19 crisis. The use of Information Technology to store large amounts of data of people infected by the virus indicated the immense role of Information Technology in Healthcare. Further the stored data was analyzed at the city, district and state level to take immediate actions to bring the national pandemic crisis under control. Information Technology has played an important role to provide reports on basis of data analysis, so that authorities at the state and national level were able to make right healthcare strategies and manage the situation successfully. The manner, in which our country, with the second largest population, has stood strong through the pandemic, is a proof of our nation's skilled and intellectual manpower and the use of Information Technology.

Association with NCSH (Nordic Center of Sustainable Healthcare), Sweden, AMC (Association of Medical Consultants), MACCIA (Maharashtra Chamber of Commerce, Industry and Agriculture), CSI (Computer Society of India) and NASSCOM has helped us to organize a relevant ICAIM 2021 with erudite Experts who will be sharing about the COVID-19 Crisis and the leverage and importance of Information Technology in one of its kind Pandemic, which grappled the entire globe.

ICAIM 2021 proceeding which has been compiled in a very short period of time due to the pandemic has research papers by Academicians and Researchers focusing on the current COVID-19 Crisis.

Being an International Conference, we have Experts from NCSH (Nordic Centre of Sustainable Healthcare), Sweden, SLU (Swedish University of Agricultural Sciences), and Digital Green (Nigeria, India, US, Ethiopia, Kenya and Nepal) who will be delivering sessions on the impactful use of Information Technology in the areas of Healthcare and Agriculture in the COVID-19 scenario.

ICAIM 2021 which overcame the challenges of the New Normal began on 15<sup>th</sup> February 2021 with the Pre-Conference sessions and IoT and R-Programming Workshops till 18<sup>th</sup> February 2021. 20<sup>th</sup> and 21<sup>st</sup> February were devoted to Expert talks and Student Activities to inculcate the thirst for research and innovation amongst the delegates and young researchers to solve problems faced by the society, with COVID-19 being the global challenge.

I am gratified to our proactive Management whose faith in our Institute has given us the confidence to organize ICAIM 2021 during the challenging times of the pandemic. My heartfelt thanks to Team TIMSCDR, for standing strong to face the New Normal and eventualise ICAIM 2021

I virtually invite the delegates of ICAIM 2021 and wish them All the very Best.



## About TIMSCDR

The Thakur Educational Group comprises of three Trusts namely Thakur Educational Trust (Regd.), Zagdu Singh Charitable Trust (Regd.) and Zagdu Singh Educational Trust (Regd.) managed by the Thakur family and runs 16 Institutes located in Kandivali, western suburb of Mumbai.

TIMSCDR (Thakur Institute of Management Studies, Career Development and Research) is dynamic institute striving to provide quality higher education. The institute is an ISO 9001:2015 certified providing three years MCA (Master of Computer Application) course. The MCA Course of TIMSCDR is NBA Accredited. All possible ways of acquiring academic insight and undertaking appropriate academic initiatives are explored at the institute. TIMSCDR also has an ISTE (Indian Society of Technical Education) chapter. Residence-cum-study facility is available for boys and girls in secured modern Hostel Buildings with green, clean and healthy ambience situated near the Institute.

TIMSCDR is organizing next International Conference ICAIM-2021 which serves as a platform for gathering all academicians, industrialist, researchers and professionals in the disciplines of Information Technology, Agriculture and Medicine (Nutrition).

## About AMC

The Association of Medical Consultants (AMC) was established in 1972 by a small group of energetic active and concerned medical consultants from distant suburbs who often assembled and animatedly discussed their common problems. Over the years, the immense need rose for an organisation of this nature and the Association grew rapidly. It is now one of the fastest growing Associations of Specialist Doctors in Mumbai and boasts of a membership strength of more than 9000 Medical Consultants. AMC represents Consultants practicing at corporate and non corporate Tertiary care referral Hospitals (both Government and Private) and individual Consultants practicing through their own consulting rooms, Clinics & Nursing Homes spread across Greater Mumbai, Navi Mumbai and Thane districts. It is recognized as a frontline Medical Organization and is an important opinion making body which addresses vital public health and professional issues facing the medical profession in general and medical consultants in particular. AMC has effectively brought together consultants of various disciplines on one platform and aims to highlight and offer solutions to all the important day to day problems faced by consultants.

## About MACCIA

Maharashtra Chamber of Commerce, Industry & Agriculture (MACCIA) is the Apex Chamber of the State. The Chamber plays a pivotal role in supplementing and augmenting the efforts of Government for the economic development of the State and advancement of its people. With more than 3500 direct Members, comprising of large, medium and Small-Scale Industries, Traders, Agriculturist and Professionals, MACCIA is the only Chamber in Maharashtra, which has deep-roots in all the 35 Districts encompassing 355 Talukas of Maharashtra. In addition over 800 Local Trade and Industry Associations and professional bodies having collective membership of over 700,000 business organizations from all over the State are affiliated to the Chamber and thus it virtually functions as the State's Apex Chamber.

## NCSH

Nordic Center for Sustainable Healthcare (NCSH) is a cross-sectoral arena and network involving stakeholders, organizations, projects and expertise in the area of sustainable healthcare, all sharing the goal to create a more sustainable healthcare sector. The network of NCSH includes companies, hospitals, regions, universities, NGOs, clusters and more. Together they form an arena which generates collaborations, projects, business, knowledge and new innovative ideas.



## **Mr. Santosh Mandlecha**

President, MACCIA

Dear Friends,

Greetings from Maharashtra Chamber of Commerce, Industry & Agriculture (MACCIA) !!!

It gives me immense pleasure to know that Thakur Institute of Management Studies, Career Development & Research is organizing the 'International Conference on Advances In Information Technology and Management with the theme "Leveraging Information Technology for Sustainability in Agriculture & Medicine - COVID-19 Crisis" on 20<sup>th</sup> & 21<sup>st</sup> February 2021, at Mumbai.

I on behalf of Maharashtra Chamber of Commerce, Industry & Agriculture (MACCIA) as the President would like to thank the Organizing Committee for Guest. I would like to Congratulate Dr. Vinita Gaikwad, Director for organizing the Conference.

We are happy to be associated with ICAIM since last 4 years. ICAIM 2021 has enviable credentials year. This Conference attracts participants amazing seminars & lectures. This trend is continued for many years.

My Best Wishes for the success of the Conference. In terms of intellectual quality and purpose of disseminating the information I would like to thank the organizers for their hard work & efforts to take this conference to greater heights.

Thanks and with Best Regards,

**Santosh Mandlecha**

President

Maharashtra Chamber of Commerce, Industry & Agriculture  
(MACCIA)



## Mr. Rajendra Bhat

Agro Consultant, Nisarga Mitra Farms

कोविड काळात सप्लाय चैन बंद झाल्यामुळे ग्राहकांना शेतातील माल पोहोचला नाही. त्यामुळे बाजारात असलेल्या वस्तूंची शहरातील लोकांनी साठवणूक करून ठेवल्यामुळे वस्तूंचा तुटवडा निर्माण झाला.

कोविड काळात Mass Communication चा वापर करून शेती आणि IT यांच्या माध्यमातून शेतमालाचे मूल्यवर्धन करून स्वतःचे आयुष्य वाढवता येईल.

इंटरनेट चा वापर करून "वर्क फ्रॉम होम" कुटुंबाची जागरूकता, मानसिकता आणि शारीरिक क्षमता निसर्ग बरोबर राहून वाढवता येईल. WhatsApp च्या माध्यमातून कम्युनिटी ग्रुप तयार करून खेड्यातल्या शेतकऱ्यांना उत्पादन करणारा वर्ग आणि उपभोग घेणारा वर्ग या दोघांचे एकत्रीकरण अन्न सुरक्षित करता येईल.

IT चा वापर करून शहरी आणि ग्रामीण जीवन एकत्र करता येईल.



## Mr. Akshay Shah

Agro Consultant, Nisarga Mitra Farms

I look forward to share my 2 cents on how digitization is a must in agriculture and healthcare and all industries for that matter, mainly in COVID times.



## Mr. Prathap Selvan

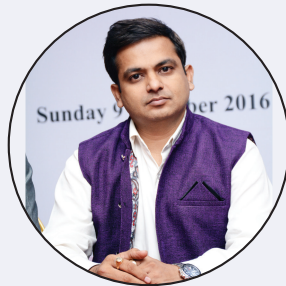
Founder and CEO at Frutunes Food Products (P) Ltd.

The success of perishable goods lies in making the finished goods reach the consumers from the farmers at the earliest". He tells that there is no universal recipe for success. For young entrepreneurs, he would like to convey that you should undergo the process of building a business and learn the aspects of running a business. Don't let failures deter you to aim for higher goals.

# Well Wishers of ICAIM - 2021



**Dr. Deepak Baid**  
President, AMC



**Dr. Ashok Shukla**  
Vice President, AMC



**Dr. Mukesh Gupta**  
Imm. Past President, AMC



**Dr. Vikrant Desai**  
Program Committee  
Chairman, AMC



**Mr. Daniel Eriksson**  
Director, TEM at Lund  
University, Founder NCSH,  
Sweden



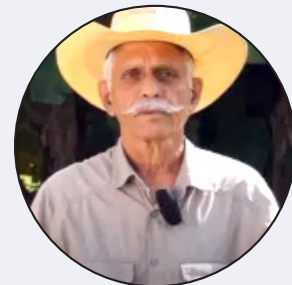
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**Dr. Deepak Baid**, President, AMC

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**Mr. Daniel Eriksson**, Director, TEM at Lund University, Founder  
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# PREFACE

International Conference ICAIM 2021 themed on Sustainability yet again has continued to research on Sustainable Healthcare and Agricultural solutions, but paying special attention to the COVID-19 crisis. The pandemic has truly changed the globe and the way things function in every sector in general and in Agriculture and Medicine in specific. Both the farmer and the healthcare workers were never a part of the lockdown phase during the pandemic. As a matter of fact they became the Front Line Warriors. ICAIM 2021 focuses on the use of Information Technology to understand and enhance the knowledge of use of Information Technology in the domains of Agriculture and Medicine with the focus on COVID-19 crisis. The association of prominent bodies like, NCSH (Nordic Center for Sustainable Healthcare) at Sweden, MACCIA (Maharashtra Chamber of Commerce, Industry and Agriculture), AMC (Association of Medical Consultants), CSI (Computer Society of India) and NASSCOM has helped in organizing an eventful ICAIM 2021 even during the COVID-19 scenario.

The COVID-19 crisis took a test of Sustainability in every aspect across the globe. Those who sustained, whether it is, health crisis, wealth crisis or emotional crisis, are surviving today. Those of who could not have either deprecated, or, are on the verge of extinction. Thus, sustainability plays an important role. Further, sustainability is developed over a period of time and cannot be compromised at any stage. Use of Information Technology has augmented enormously in every domain. Agriculture and Medicine being the prime domains have been leveraging Information Technology to enhance the production of food and life span respectively. There has been recognizable use of Information Technology for Sustainability in both these domains.

During the COVID-19 crisis IT played a central role to sustain through the calamity. Data was used presumptuously to draw life saving conclusions in the Healthcare sector to fight against the pandemic. Several decisions and strategies were based on the way the Healthcare data was presented before the decision makers and Information Technology played the major role. Data representation and analysis using IT tools like Big Data, Artificial Intelligence, Machine Learning and Deep Learning, helped in understanding the situation of the Healthcare crisis across the entire globe and make timely decisions. The spread of the virus could be tracked at every second with the help of constant and current data availability due to the use of Information Technology, as the world grappled in the clutches of the pandemic.

Use of online Marketing became a boon for the Agriculture sector as farmers produce did not go waste during the lockdown phase and could be purchased online and delivered using safe logistics to the customers. Information Technology was progressively used in online Marketing and in Logistics.

As a part of the education sector we realized the importance of IT during the pandemic as we used it seamlessly to deliver the educational programs to the students within the given time span. Use of Virtual Classrooms was a fascinating, though challenging experience. The student teacher interactions changed immensely on the Virtual platform. Students are mere icons on the screen and teachers found it exigent to communicate with these icons. Examinations were given fearlessly by the students without the usual anxiety.

The entire world fought against the COVID-19 crisis collectively. The period of lockdown in several parts of the world brought a positive change in the environment too, as the global warming showed signs of recession. The environment became cleaner as there was lesser travelling resulting in drastic reduction of Carbon Emissions.

Information Technology has played a pivotal role during the COVID-19 Crisis. India, with the second largest population, was able to sustain the COVID-19 crisis, as national leaders on different fronts, could devise strategies that helped the nation to stand strong during the pandemic. Several technologies have evolved and are used vibrantly to tackle the situation as the spread of the virus is within control across the globe. The timely generation of the COVID-19 Vaccine, which also made us of Information technology at several stages, has brought in much relief as life is coming back to Normal.

The theme of the Conference – is opportune to the current situation and provided the occasion of several interactions with experts from the domains of Agriculture, Medicine and Information Technology virtually.

ICAIM 2021 Proceeding has evolved over a very short period due to the challenges of the pandemic. Research papers concerning problems faced during the pandemic in the fields of Agriculture, Medicine and the leverage of Information Technology have been collated in the proceeding.

Dr. Vinita Gaikwad  
Director

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