INDIA-MEXICO BUSINESS NEWS

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Science and Technology

Daksha Group Launches

Brahma AI: An innovative AI system for assisted diagnostic of Cancer.

CORPORATE OFFICES IN MEXICO GLOW IN TRICOLOR LIGHTS

Renown Corporate buildings across Mexico in cities like Guadalajara, Querétaro and Mexico City, were illuminated with tri-colored lights as part of the conmemoration of "Azadi ka Amrit Mhostav" on the day of India´s 76th anniversary of Independence.

As the sun set in Mexico City on Monday, August 15th, 2022 IMBC staff and Indian nationals witnessed the iconic **"Lavadora"** corporate building located in the heart of Santa Fe, glow in the tricolors of the Indian national flag, wishing all Indians across Mexico and Latin America a happy independence day.

BRAHMA AI: AN INNOVATIVE AI SYSTEM FOR ASSISTED DIAGNOSTIC OF CANCER

DR.RICARDO GARCIA RUIZ
AI DEVELOPER DAKSHA GROUP

Abstract

Brahma AI, an AI-driven platform with the ability to detect and classify abnormalities in mammographic breast images. Brahma AI aims to expand its capabilities in cancer diagnostic assistance, and this is the landscape in which it is starting to make its way into this field.

Artificial intelligence for health

Artificial intelligence (AI) supports disease diagnosis, as the interpretation of medical information is a cognitively challenging task. This applies not only to experienced professionals, but also to those professionals with little or different experience, such as young attending physicians. The time available to medical specialists is often limited, diseases can evolve and patient dynamics change over time, making diagnosis a very complex process. AI algorithms exploit medical data to generate predictions, learn and continuously develop over time by constantly processing new and updated data. Algorithms acquire information through different sources of information, including that accumulated over time. Therefore, AI-driven systems can process more knowledge compared to humans, and possibly surpass them in certain medical tasks. Integrating AI into existing technical infrastructure accelerates the identification of relevant medical data from multiple sources, which is tailored to the patient's needs and the treatment process. AI prevents information stagnation by sharing knowledge across departmental boundaries of an institution.

AI can analyze data from large populations without biases dependent on subjective personal experiences, emotions or even time of day, achieving results equal to humans but in less time (Mirbabaie et al., 2021).

The detection and follow-up of cancer requires the analysis of clinical, radiological, and histological images. Given the complex morphology of tumors, there is variability of appreciation among interpreters of these images when characterizing them. Image acquisition equipment has different resolution capabilities and data utilization protocols vary by manufacturer. This is an area of intervention where AI can help automate image preprocessing, region of interest (ROI) segmentation and feature extraction to distinguish healthy tissue from diseased tissue. Choosing relevant features while avoiding redundancy and building a mathematical model capable of identifying the patterns of a malignant tumor will allow training algorithms fully or partially supervised by clinical specialists. Preferably, these models should be tested with a series of external images and retrained with new images to increase their predictive robustness.

Breast cancer diagnosis

Breast cancer is currently the most common cancer in women in at least 159 countries and the leading cause of death from cancer (Sung et al., 2021). Early detection could improve survival or reduce morbidity, improving quality of life. Early detection of the transition from normal cellular activity to dysregulation toward cancer involves knowing the physiological changes that are precursors to disease and detecting them early. Screening studies are very useful for treating asymptomatic individuals who may potentially develop cancer. This makes it possible to diagnose the disease in its early stages, increasing the likelihood of effective treatment and increasing healthy life expectancy.

The development of accurate and sensitive technologies to detect early cancer biomarkers is a challenge that today can be tackled with greater advantages thanks to the new computational possibilities of mass data analysis, the increased connectivity of diagnostic devices and the culture of prevention for patients who can now access quality medical information on the internet.

X-ray mammography is a technique widely used in breast cancer screening, which is relatively fast and inexpensive. The major role for mammography is the earlier detection of breast cancer in asymptomatic women. By analyzing the morphology of the tissues in these images the presence of potentially malignant bodies can be located, however this technique is limited by the resolution of the images since only bodies can be appreciated when they already measure a few millimeters and when the studies are performed they expose the patient to ionizing radiation (Crosby et al., 2022). The efficacy of mammographic screening has been established by randomized controlled trials in which significant breast cancer mortality reduction has been achieved by the ability of mammography to depict ductal carcinoma in situ and infiltrating cancers at a smaller size and earlier stage than in control groups not offered screening (Cullinan, 2002).

A widely used reference system for mammographic image assessment is the American College of Radiology's (ACR), “Breast Imaging Reporting and Data System” (BI-RADS). This is illustrated with an atlas that contains approximately 700 images that describe the tissue morphology of the breast through images obtained by different imaging techniques. This system allows the use of a standardized nomenclature between different health centers, to classify specific tissue formations
(ACR, 2014).

Brahma AI, a CAD system for breast cancer diagnostics

Brahma AI is a CAD system that uses a set of neural networks to detect abnormalities in mammograms according to the morphological description of the fifth edition of the BI-RADS Atlas (ACR, 2014). It is trained with mammograms from the CBIS-DDSM public database that have been validated by expert radiologists and whose diagnosis has been confirmed with biopsies (Lee et al., 2017). Brahma AI can detect and classify 77 morphological variations of calcifications, 53 variations of masses and 13 distortions of the architecture of the breast tissue. Preliminary tests with a discrete population of patients from India (figure 1), it has been possible to correctly detect and classify a mass (figure 2) with morphological characteristics of type 4B according to the BI-RADS Atlas and, in another patient, a distortion of the architecture (figure 3) with characteristics suspicious for malignancy. Both findings were validated by an expert radiologist.

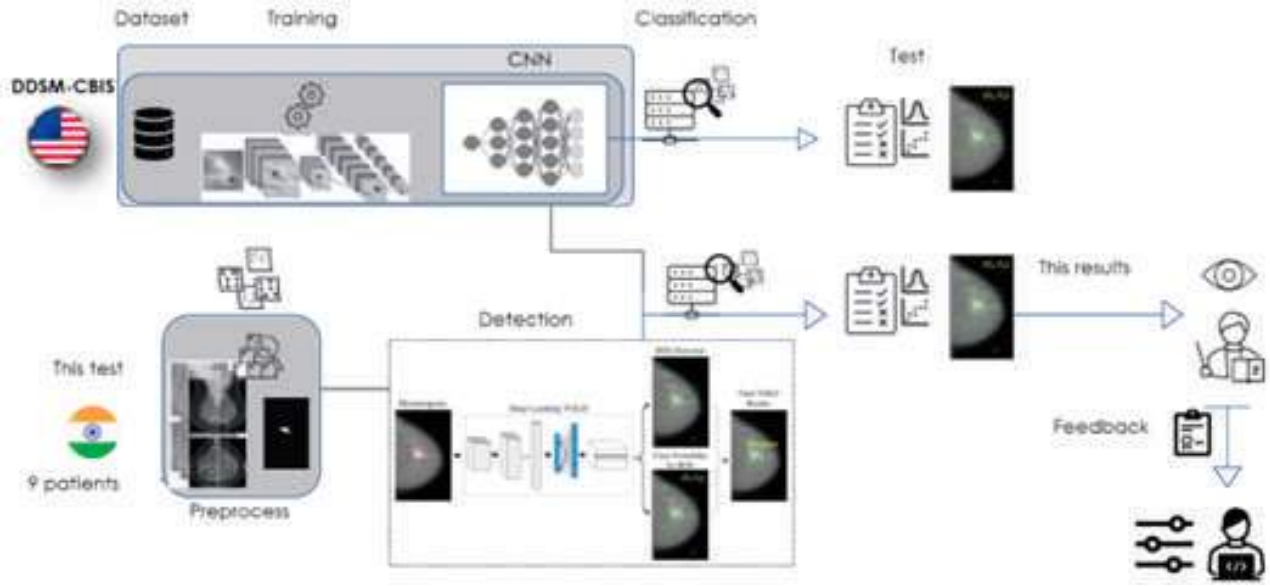


Figure 1. "Brahma AI" is a platform for the detection and classification of breast abnormalities in mammography. It was trained with images from the “Curated Breast Imaging Subset” from the “Digital Database for Screening Mammography“ (CBIS-DDSM), (Lee et al., 2017). The images in this data set are from the United States of America and we chose only those proven by subsequent biopsy. We use convolutional neural networks (CNN) to classify the findings of our anomaly detector.

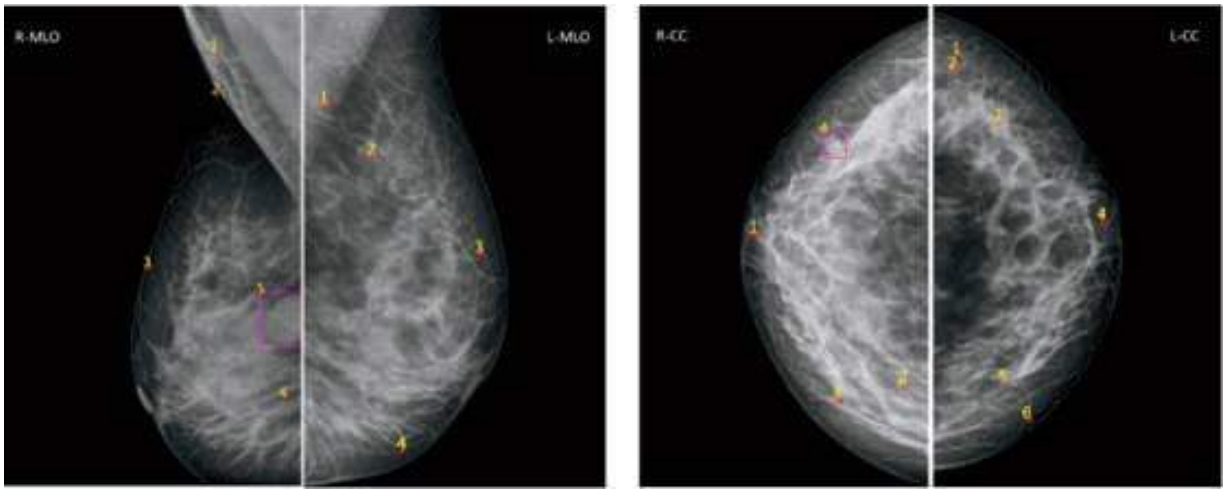


Figure 2. Example of detection of a mass by Brama AI in a 41-year-old patient (R-MLO, pink box number 5 and R-CC, pink box number 4). Red boxes in all four views mark detection of pleomorphic microcalcifications.

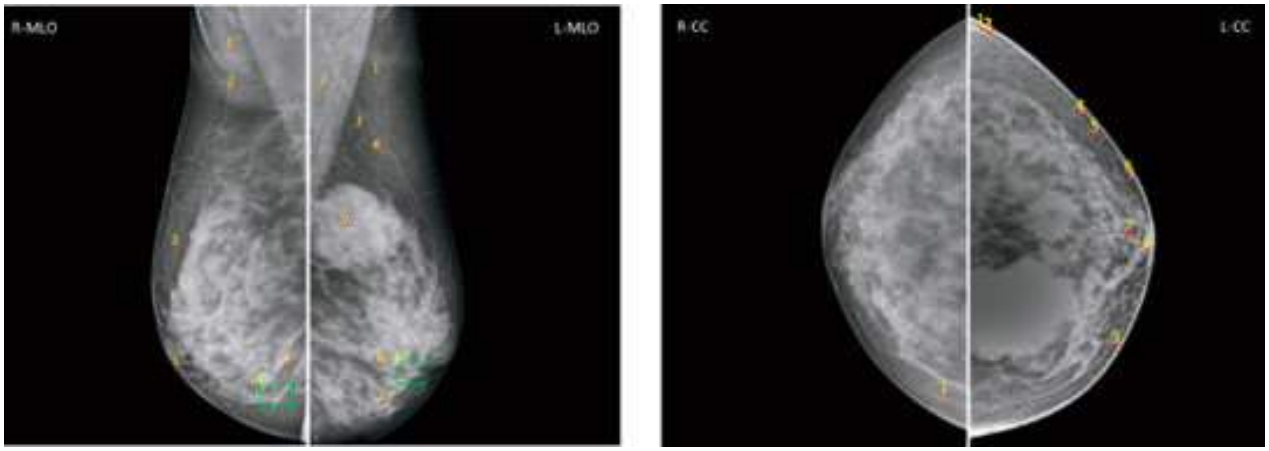


Figure 3. Example of detection of architectural distortion by Brama AI in a 50-year-old patient (R-MLO, green box number 6 and L-MLO, green box number 8). Red boxes in all four views mark the detection of amorphus and pleomorphic microcalcifications.

The diagnosis of breast cancer is confirmed by histopathological evaluation of the biopsy of the suspicious tissue. The Nottingham grading system allows determining the degree of tissue alteration according to the presence of some features such as nuclear pleomorphism, tubular formations and the number of mitotic bodies (Elston & Ellis, 1991). Brahama AI has been trained with the public histopathological image database BreCaHAD (Aksac et al., 2019), which consists of 162 light microscopy images of slices obtained from breast biopsies stained with hematoxylin and eosin (H&E). Morphological analysis of the images can identify the location of mitotic and apotosis bodies, as well as the distinction of the lumen from tubules or other inter-cellular space. It can also locate cell nuclei of tumor or non-tumor regions as illustrated in figure 4.

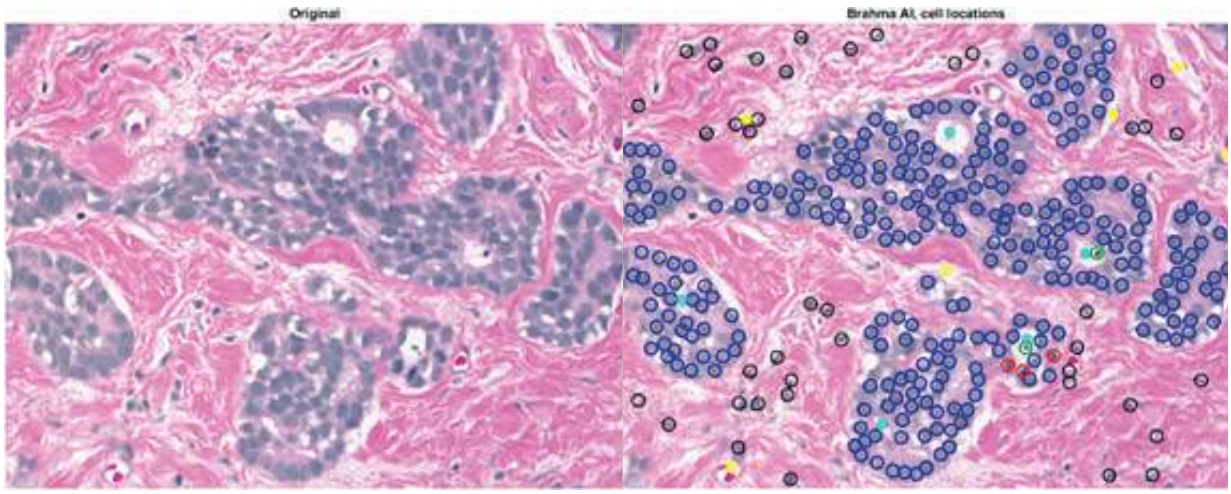


Figure 4. On the left we observe a representative image of a 4 micron thick breast tissue slice stained with H&E. On the right we observe the markings made by Brahma AI of the image. The blue rings locate the nuclei of tumor cells. The black rings indicate non-tumor nuclei. Red rings are mitotic bodies and green rings are bodies in apoptosis. The cyan circles are lumen of tubules and the yellow circles are another type of inter-cellular space.

The present findings of our system are limited by the amount of data we use to train the neural networks. Ideally we require more images of different ethnic origins, ages, and tracking of the same people to strengthen the system. We use only biopsy-confirmed cases and require feedback from a pathologist to refine system settings to improve detection accuracy and interpretation of results.

Brahma AI now contains more than 35,000 Dicom images of patients from countries like US, UK, Portugal, Egypt, Vietnam, China and India. Brahma Genetech is working closely with largest non profit cancer foundation in Mexico to assist them in the process of early diagnosis. Brahma AI is made available to other state level hospitals in Mexico to assist them for preventive early diagnosis.

The company, has also appointed distribution and implementation partners in the United States to start offering from the year 2022. Apart from breast cancer, Brahma AI is aiming to start offering other cancer detection modules through the platform. These modules include AI libraries for Cervical Cancer, Lung Cancer, Gastric Cancer, Prostate Cancer, Skin Cancer and Pediatric Cancers. If you need more information on how Brahma AI can help your hospital or foundation, please write to info@brahmagene.tech or our parenting company Daksha Group.

DAKSHA GROUP

BRAHMA GENETECH

MEMBERS MEETING CHAIRED BY HONORARY MEMBER

Members of the India- Mexico Business Chamber held their monthly members meeting, where H.E. Dr. Pankaj Sharma Ambassador of India to Mexico and Ms. Vallari Gaikwad, Commercial and Economic representative of the Embassy of India to Mexico, participated as guests of honor.

During the meeting President of IMBC, Mr. Rajeev Gupta, proudly gave an Honorary Member certificate to H.E. Dr. Sharma and thanked him for his ongoing support in all IMBC initiatives.

further more, IMBC gave a brief update on all of the ongoing work and achievements IMBC has successfully accomplished.

The Embassy of India in Mexico shared with IMBC and members the ongoing work to negotiate a free trade agreement with Mexico, the embassy confirms that the dialogue for the same has already been started with the Ministry of Economy of Mexico.

In addition, Ms. Gaikwad shared initiatives she is going to implement in benefit of the Indian companies in Mexico.. She shared that the Embassy had the interest in inviting IMBC members to speak in different universities. Moreover, the Embassy will focus efforts in including information of the Indian companies in Mexico in their monthly newsletter.

As a strategy to increase the commercial trade figures, the embassy of India in Mexico will display in their webpage all expo´s in Mexico and in India, with the aim of incentivizing bilateral business delegations.

A GLIMPSE OF INDIA- MEXICO COMMERCIAL RELATIONS

The India- Mexico Business Chamber, participated as one of the panel speakers along with other bilateral organizations in the **First International Forum 2022**, organized by Jovenes Empresarios Coparmex del area Metropolitana.

During the forum, IMBC had the opportunity to share trade figures between India and Mexico, strategic sectors, investments from India in Mexico and investments from Mexico in India.

The emerging sectors of India and the trade and business opportunities amongst both countries were included in the presentation. While Showcasing the numerous business opportunities in different sectors, IMBC emphasized on the importance of reviewing the INCOTERMS before closing any business deal or proceeding to the importation of product.

Moreover, IMBC informed the participants of the upcoming exhibitions, business buyer seller meets, and business delegation opportunities for specific sectors.

IMBC ENGAGES WITH MINISTER OF ECONOMY & GOVERNOR OF TLAXCALA

Right:
H.E. Lorena Cuellar Moreno, Governor of the State of Tlaxcala, Mexico,
H.E. Dr. Tatiana Clouthier, Minister of Economy of Mexico
Amit MIglani, Director of LaTAM U- FLex Limited (Flex Americas) , Secretary of IMBC
Amparo Kushelevich, General Administrator of IMBC

Secretary of the India- Mexico Business Chamber, Amit MIglani, had the opportunity to engage in a fruitful discussion with H.E. Dr. Tatiana Clouthier, Minister of Economy of Mexico. Mr. Miglani, shared brief history of the chamber and the many achievements since it´s reactivation in 2019 and more importantly the milestones reached despite being struck by the global pandemic, just 9 month´s after it´s reactivation.

H.E. Dr. Clouthier, acknowledged the work, growth and ambitious agenda of the chamber in becoming an influential body. Furthermore, H.E. considered the role of IMBC as an important resource, serving as a bridge for companies in both countries.

IMBC in return discussed the interest in promoting joint initiatives in continuance to the **Mexico- India Economic Opportunities Forum**, jointly organized by the Ministry of Economy of Mexico, The Embassy of India in Mexico and the India- Mexico Business Chamber in November 2021.

In addition, both discussed the importance of working towards pythosanitary work plans for 8 products identified to have great potential in the Indian market, and agreed on the importance of diversifying mexico´s produce and really taking advantage of the strategic partnership with India.

Honorable Governor of the state of Tlaxcala Ms. Lorena Cuellar, expressed deep sense of gratitude for visiting her state and agreed mexico had many areas of opportunity for investment attraction.

She was very happy to learn IMBC will be working closely with the Ministry of Economic Development of the State Government of Tlaxcala, and looks forward to our members exploring and considering the state for future investments or investment expansions.

CELEBRATING STRATEGIC ALLIANCES

The Mexican Association of Secretaries of Economic Development *Asociación Mexicana de Secretarios de Desarollo Economico (AMSDE)* and The India- Mexico Business Chamber participated in the Second Ordinary Assembly of AMSDE. Where both signed a Memorandum of Understanding as a result of the continuous meetings with C.P. Carlos Garcia, Secretary of Economic Development of the State Government of Tamaulipas, current President of AMSDE.

IMBC in collaboration with AMSDE aim to work together with the Secretaries of Economic development of the 32 States in Mexico, focusing on investment attraction, skill training and talent development. IMBC will support in promoting long term business relations between both countries.

EDUCATION AS A GROWTH ENGINE

LIC. ADRIANA OLMEDO
BYJU'S FUTURE SCHOOL

India has undoubtedly become a world benchmark for innovation, technology and leadership, being a central element of its economic policy. It is not surprising, then, the significant improvement that the country has had in the Global Innovation Index, in which it improved 24 places in just 4 years.

In terms of the quality of its innovation (as measured by the quality of scientific publications, universities, and patent families), India ranks second among middle-income economies worldwide. It also appears in the Index classification as one of the main science and technology hubs in the world. Bangalore, Mumbai and New Delhi are among the top 100 internationally.

While the world has watched this development, the question remains how they have achieved it. And the answer, to a large extent, lies in education, which has become one of the fundamental issues in the development of public policies, making a clear and successful commitment to migrating to the knowledge economy.

India made the decision to focus its economic development on technology, while recognizing the importance of education to have trained workers who could respond to the natural demand that the industry would demand. After years with this approach, the result in its educational drive is that professionals from that country have a global presence and are highly valued in the technology industry.

Education is inherent in the history of India, a fundamental part of its culture, which transcends acquiring technical knowledge to seek complete training. Without losing sight of the great challenges implied by its diversity and population density, the creation of dynamic relationships between the government and civil society was facilitated, in addition to making revisions to its educational policy, always seeking to guarantee access and quality.

Mexico many challenges with India, which is precisely why we see the same three elements to change our country: education, innovation and technology.

For years, we have tried to migrate from “made in Mexico” to “created in Mexico”, leaving behind mere labor to become a country of creative minds. That was just the transition that India achieved, with education as a central component to develop talent, beyond a technical apprenticeship.

Technology is a transversal discipline to all activities. In that sense, looking at it as part of a "science" curriculum is a deviation of perception that does not correspond to today. There is no area of knowledge that does not have specific technologies or technological objects. That is, each of them has different proposals, problems and solutions.

Something fundamental in this process is that technology-based education is not only about adopting some instruments for teaching, but that there really is a pedagogical methodology that allows an effective, deep and satisfactory teaching-learning experience for both parties.

At BYJU'S FutureSchool we not only teach our students programming languages, but also contribute to the development of skills such as critical thinking, problem solving skills and foster creativity. This generates a change in the way they learn for the rest of their lives, both at school and professionally.

We know that it is impossible to guess the professional challenges that those who are in basic or secondary education will face today, but we do know what tools can help them solve any problem or uncertainty.

Educating for the future does not mean giving answers, but rather the ability to find solutions for themselves. All of the above is part of the heart and development of BYJU'S FutureSchool. Being our own platform, developed by education professionals, we have programs and processes that, we are sure, can completely change the paradigm of education. And we are ready to do it immediately.

It is time to change the way it is taught in Mexico and how our girls and boys relate to learning. If we manage to make them see it as an opportunity, as something they enjoy, we can change the mentality of the new generations so that they are creators and agents of transformation.

SECRETARY OF SEDEYT MORELOS MEETS WITH LOCAL INDIAN COMPANIES

The India - Mexico Business Chamber and member companies based in the State of Morelos held a meeting with Dr. Ana Cecilia Rodriguez González, head of the Ministry of Economic Development and Labor (SDEyT).

Members of the chamber had the opportunity to introduce and talk about their companies current operations in Mexico and the interest of introducing new projects and transfer of technology in to Mexico in the near future.

in addition they expressed their high interest helping create greater availability of qualified talent for the pharmaceutical sector. Through specific collaborations with the local investigation centers and universitie, with the aim of adding value to the academia with initiatives such as training, skill development, as well as promoting internships and employment.

IMBC MEETS WITH MINISTRY OF ECONOMY

IMBC´s Executive Committee meets with Dr. Monica Duhem, Head of the Global Economic Intelligence Unit, as a result of the points discussed with H.E. Dr. Clouthier, Minister of Economy.

During the Meeting, both, Vice President and Secretary of IMBC convey the interest of working together to further boost the bilateral business engagements to continue to strengthen the bilateral commercial relationship between both countries.

Specific sector issues were raised and both IMBC and Ministry of Economy are committed to working towards viable solutions that benefit investment attraction and benefit the business ecosystem.

I.T. SUBCOMMITTEE CONTINUES TO IMPULSE THE SECTORIAL STRATEGIC AGENDA

IMBC´s I.T. Executive committee held a meeting with the aim of updating the members of the I.T sector on the progress of the subcommittee´s agenda.

Members of the chamber mentioned it was a priority to work towards skills and training in the I.T academia in Mexico considering the lack of talent and human resources available in Mexico.

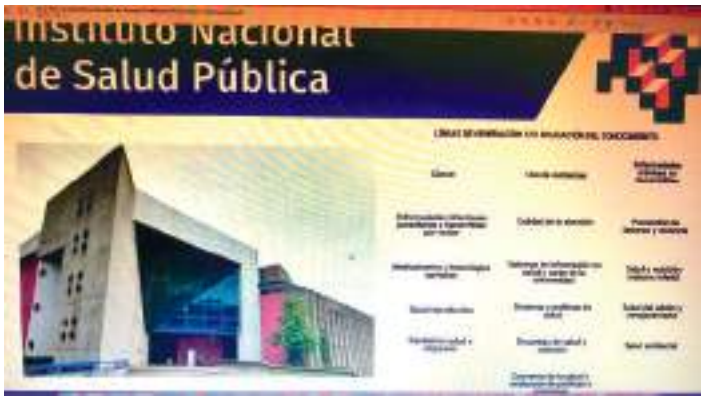
In this regard, IMBC roposed a team meeting and a work table with the UIEG team to discuss viable solutions and job creation in the country. In addition, IMBC shared that the Digital empowerment Summit has been confirmed for the 29th of September of this year in the Chamber of Deputies.

IMBC MEETS WITH SCIENCE AND INNOVATION HEAD OF SEDEYT MORELOS

IMBC begins cooperation dialogue with Lic. Paulin, head of the Science, Technology and innovation department in SEDEyT Morelos.

Both sides discussed the interest in adding value and creating more jobs in México. in addition to the opportunities for the academia, including teachers.

In this regard, IMBC Members will be invited to a Pharma industry meet on September 8th 2022, various stakeholders, academia, investigation centers and professors.



CIPLA JOINS HANDS WITH BIRMEX

IMBC was proud to be invited to represent the India- Mexico Business Community during the culmination of one of the many achievements after the visit of the Secretary of Foreign Affairs of Mexico, Marcelo Ebrard, to India last April, with the aim of strengthening the Mexican health system through negotiations and reaching agreements focused on technology transfer for the production of vaccines and medicines in Mexico.

The MoU will involve trade agreements to ensure a short-term supply of oncological and retroviral drugs to Mexico, and a technology transfer arrangement to ensure that Birmex has the capacity to manufacture these products to supply the country.

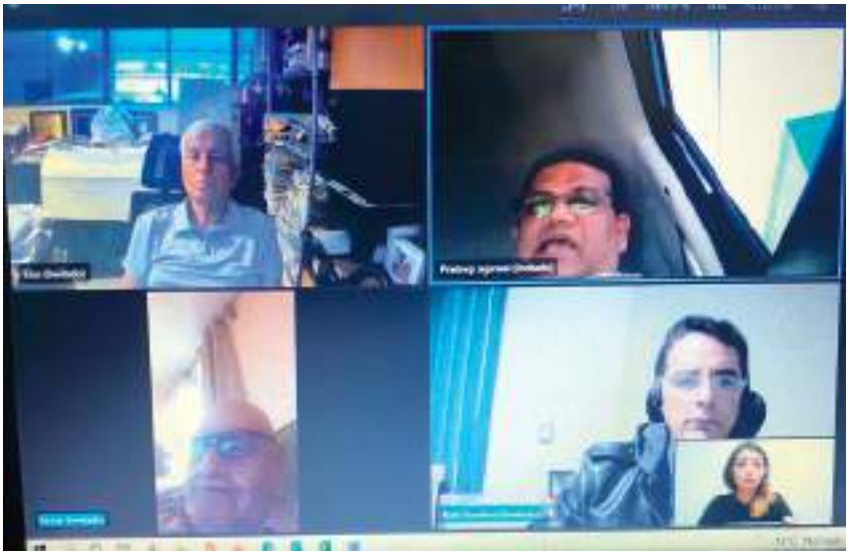
IMBC AND MINISTRY OF ECONOMY WORK TOWARDS COMMON GOALS

IMBC and Dr. Luz Maria De La Mora, Vice-minister for Foreign Trade, Ministry of Economy of Mexico, held a very productive meeting focused on investment expansion and attraction of new investments. Both agreed to work towards joining hands to foster new investments and support investment expansions of the indian companies already in Mexico.

In addition IMBC expressed the interest in working together to find viable solutions to ease trade. Mentioning the importance of learning how the Alerts system works and what H.S. codes are being considered under this Alerts system. This with the aim of working with our members to take preventive actions and leading our members to avoid issues during the import process in customs.

ENCOURAGING BUSINESS BETWEEN INDIA AND MEXICO

IMBC conducted a Meeting between Concanaco Servytur Nacional and their chapter in Hidalgo and Jalisco and Member of IMBC Mr. Pradeep Agarwal, CEO of Indian Plaza and Honorary Representative of the AYUSH Council in Mexico.



The Representatives of Concanaco Servytur discussed their high interest in learning about Ayurveda and the culture of wellness.

Within their mission to reactivate the economy and tourism in Mexico, they have identified potential touristic destinations across the different states of Mexico. Specifically in States like Hidalgo, where they have ecological and nature resorts with clear blue waterfalls and hot springs and the state of Jalisco where they have nature resorts as well and are highly interested in exploring the Ayurvedic spa concept, alternative medicine, meditation, and yoga.

INDIA-MEXICO WORK ROUND TABLE

The I.T. Subcommittee held a productive meeting with the Ministry of Economy in continuance to the meeting held with the Executive Committee of the India-Mexico Business Chamber.

The work table focused on discussing strategies to work towards talent development, skill training and certifications in I.T. The Ministry of Economy shared with IMBC members that they are currently working on building partnerships with different stakeholders and invited IMBC members to sum up to identifying areas of opportunity in program implementation for skill training and certifications required in the field.

IMBC will be working closely with the Ministry of Economy in idetyfying the states of interest, careers and specific profiles to develop through specific training programs.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EXECUTIVE COMMITTEE

Rajeev Gupta
President
Presidencia@indiamexicochamber.org

Gurulinga Konanur
Vice President
Vicepresidencia@indiamexicochamber.org

Amit Miglani
Secretary
Secretario@indiamexicochamber.org

Anurag Tripathi
Treasurer
Tesoreria@indiamexicochamber.org

Amparo Kushelevich
General Administrator
Tel: 556423-4479
administracion@indiamexicochamber.org

Rodrigo Blanco
Advisory Board
advisoryboard@indiamexicochamber.org

Address:
Ave. Paseo de la Reforma180 Piso12,
Colonia Juarez,Alc. Cuauhtémoc,
C.P. 06600, CDMX
Tel: 558311-4434
www. indiamexicochamber.org

@Indomexchambe @IndoMexChamber @indiamexchamber

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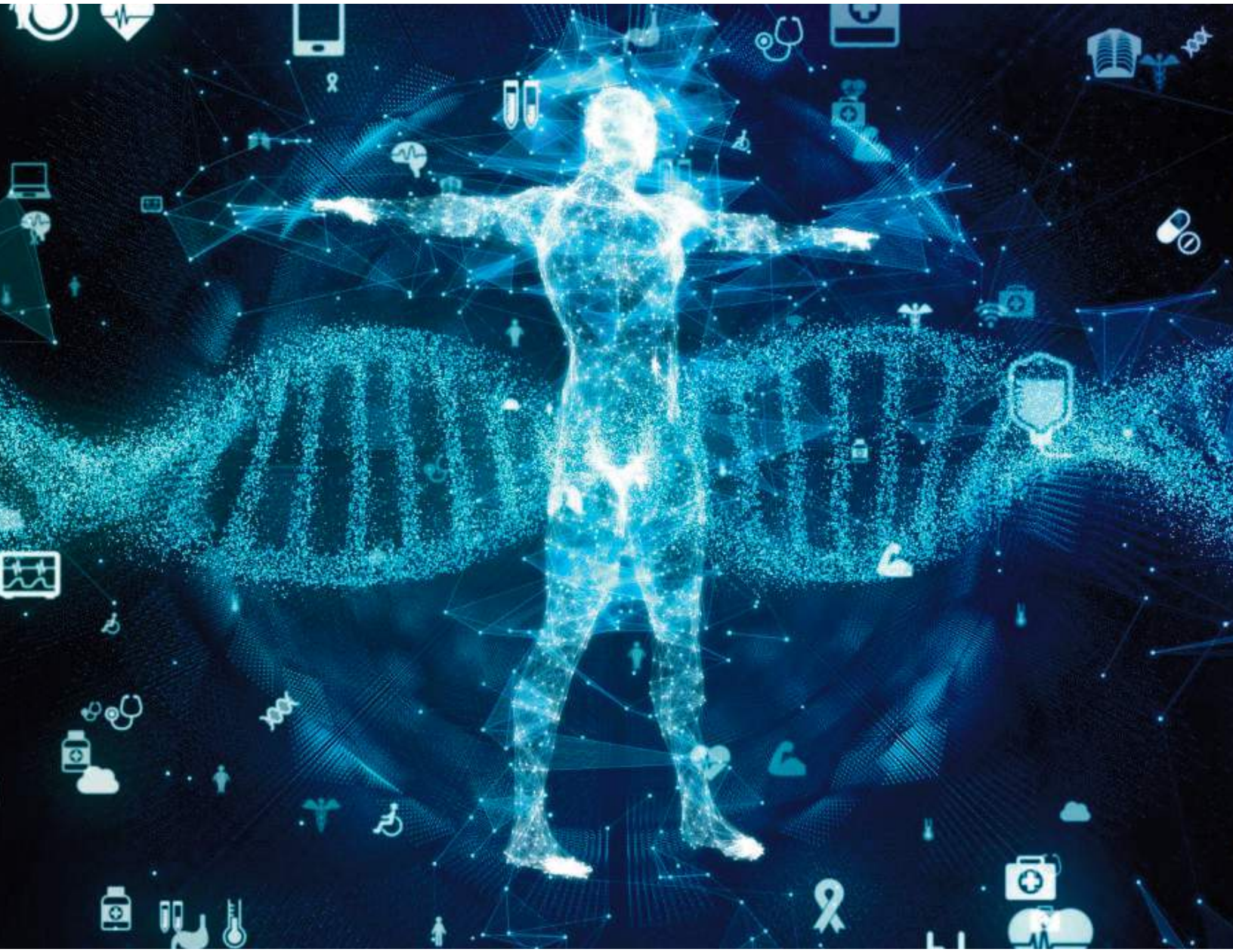

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WWW. BRAHMAGENE.TECH
WWW,DAKSHA.MX
WWW.DAKSHACAPITAL.COM

INFO@BRAHMAGENE.TECH

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