



International Knowledge Centre
for Engineering Sciences and Technology
under the Auspices of UNESCO
联合国教科文组织国际工程科技知识中心

Newsletter

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International Knowledge Centre for Engineering Sciences
and Technology under the Auspices of UNESCO



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The International Knowledge Centre for Engineering Sciences and Technology (shortened as “IKCEST”) is a category 2 centre under the auspices of the United Nations Educational, Scientific and Cultural Organization (shortened as “UNESCO”). IKCEST was established on June 2, 2014. The Chinese Academy of Engineering is responsible for the operation and management of the IKCEST.

Under the auspices of UNESCO, IKCEST is a comprehensive and international knowledge centre devoted to the engineering sciences, technology and applied technology. IKCEST aims at connecting engineering sciences and technology institutions globally, assembling various digital resources relating to engineering sciences and technology, building up a public data service platform and corresponding service environment, and coordinating the building of various professional knowledge systems, thus providing knowledge-based services at a global scale in the form of consultancies, scientific research and education for policy-makers and engineering science and technology professionals in the world, with particular reference to the developing countries.

The specific tasks and functions of IKCEST are as follows: to establish an international engineering and technology resources hub; to establish a public data service platform, and to develop the technology for mining and analyzing knowledge from big data; to cooperatively build professional knowledge service systems, and to build capacity in developing countries; to foster interdisciplinary engineering talents with big data processing ability; and to assist UNESCO to fulfill its aims and support its action plans.

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Third to seventh Training Program for Silk Road Engineering Science and Technology Development held at Xi'an Jiaotong University

The third to seventh Training Program for Silk Road Engineering Science and Technology Development co-organised by the International Knowledge Centre for Engineering Sciences and Technology under the Auspices of UNESCO (shortened as "IKCEST") and Xi'an Jiaotong University, on the themes of "The Theory and Innovative Applications of Big Data", "Advanced Medical Science and Technology Development" and "Innovative Training on Theoretical and Practical Application of Internet of Things", were held at Xi'an Jiaotong University on September 17, September 25, October 29, December 9 and December 13. Over 200 overseas and exchange students from more than 20 countries along the Belt and Road, including Pakistan, Nepal, Kenya, Rwanda, Cameroon, Nigeria, Thailand, Sri Lanka and Uganda, as well as Hong Kong and Taiwan of China who are currently studying at Xi'an Jiaotong University, Northwestern Polytechni-

cal University, Xidian University, Chang'an University and China University of Petroleum, took part in the training.

The third training program on "The Theory and Innovative Applications of Big Data" used the model of group teaching plus technical visit. The group teaching part included nine subjects, i.e. management and marketing, Chinese perspective, managing data as a product, China's opening: a historical review, business analytics for big data, cloud computing and scalable data analysis, cultural difference between China and the West, the management and business innovation driven by the development of information technology, the past and future of One Belt and One Road. The trainees also visited a 3D molding laboratory of engineering technologies.

The fourth and sixth training program on "Advanced Medical Science and Technology Development" included three modules, i.e. frontier



technologies in basic medical science, frontier technologies in clinical medical science and experience of traditional Chinese culture. The training mainly took place in the form of thematic lectures on the latest development of key medical disciplines, including the opportunities and challenges of molecular medicine era, and the advancement of the diagnosis and treatment of endocrine diseases; the integration of latest engineering technologies and medical science, such as the application of 3D printing in orthopaedic surgery; as well as some other special topics, such as the trend of infectious diseases control and prevention along the Silk Road. Based on the feedbacks given by the trainees of the second training program on the same theme, the fourth and sixth training program also included courses on the latest development of clinical medical science.

The fifth and seventh training program on “Innovative Training on Theoretical and Practical Application of Internet of Things” included three modules, i.e. Internet of things theories, frontier knowledge of Internet of things and traditional Chinese culture. The training mainly took place in the form of lectures, covering such topics as 5G in a nutshell, security challenges for the Internet of things, software defined networking (shortened as “SDN”), Internet of things and big data, smart device and system for Internet of things, Internet of things: concepts, techniques, and challenges, Internet of things and smarter life, and a brief introduction to Chinese culture. The trainees also visited the terminal test laboratory of the R&D Centre of ZTE Corporation.

At the end of the training, the organisers of the program issued certificates to the trainees who have completed all the studies and passed the exam.

IKCEST delegation made survey and study tour to UNESCO C2ICs in three Latin American countries

Since June 2016, the International Knowledge Centre for Engineering Sciences and Technology under the Auspices of UNESCO (shortened as “IKCEST”) has held several video conferences with Category 2 Institutes and Centres (shortened as “C2ICs”) under the auspices of the UNESCO in the Dominican Republic, Colombia and Peru to discuss relative issues on signing a cooperation agreement and joint establishment of an informa-

tion and knowledge sharing platform proposed by IKCEST. In order to accelerate the construction of the platform, the IKCEST delegation visited the UNESCO C2ICs and state universities in Latin America from October 11 to 21, 2016. The trip brought the delegation to institutions like the Centre for the Sustainable Management of Water Resources in the Caribbean Island States (shortened as “CEHICA”) in Santo Domingo, Dominican Republic, the Centro

Regional para el Fomento del Libro en América Latina y el Caribe (shortened as “CERLALC”) in Bogota, Colombia, the National University of Colombia, the Centro Regional para la Salvaguardia del Patrimonio Cultural Inmaterial de América Latina (shortened as “CRESPIAL”) in Cuzco, Peru, and the National University of Saint Anthony the Abbot in Cuzco.

The delegation was headed by Prof. Pan Yunhe, former Executive Vice President of CAE, Co-Chair of the IKCEST Advisory Committee and member of the IKCEST Governing Board, and other members included Song Dexiong, Executive Deputy Director of IKCEST, Zhang Song, Deputy Director of the Presidents’ Office of the General Administration Department of CAE, and Liu Chang, Director of the Division of International Cooperation of IKCEST. Given that Zhejiang University is a technology partner of IKCEST, Prof. Zhuang Yueting, Dean of the College of Computer Science and Technology, Zhejiang University, and Dr. Zhang Yin, Associate Professor of the college, joined the delegation to discuss technology issues.

Centre for the Sustainable Management of Water Resources in the Caribbean Island States (CEHICA)

The delegation visited the CEHICA undertaken by the Centre for the Sustainable Management of Water Resources in the Dominican Republic (shortened as “INDRHI”) on October 12.

In his opening address, Prof. Pan Yunhe said he was very glad to visit the beautiful city of Santo Domingo and the CEHICA, and he hoped IKCEST work together with CEHICA with the help of information technology and contribute to the human society. The delegation made a video presentation to introduce the founding philosophy and work progress of IKCEST. Some 20 representatives on the Dominican side were present, giving a detailed account of the operations of INDRHI and CEHICA. INDRHI was established in 1965 and had been affiliated to the Ministry of Agriculture until 2000. After that it has been managed by the Ministry of Environment and Natural Resources. INDRHI is mandated to plan the sustainable use of water resources, and evaluate, design, execute and oversee all projects related to the use of ground and underground water resources in the country. INDRHI rep-



representatives gave a full account of water resources in the Dominican Republic, and discussed with the delegation about future cooperation. The delegation also toured several laboratories specialised in testing sewage, soil and water and bacteria management.

Afterwards, IKCEST Executive Deputy Director Song Dexiong and INDRHI Executive Director Ing. Olgo Fernández Rodríguez signed the Memorandum of Understanding on behalf of the two sides under the witness of Fu Xinrong, Representative of the Office of Commercial Development of China in Dominican Republic, Zhang Yuehui, President of the Chinese General Chamber of Commerce in Dominican Republic, as well as representatives from both sides. The two sides agreed to carry out all-around cooperation within the MoU framework.

CERLALC

The IKCEST delegation visited the CERLALC in the city of Bogota, Colombia on the morning of October 14.

The delegation was received by Marianne Ponsford, Director of CERLALC, Bernardo Jaramillo, Head of the Technology Department, Ramon Villamizar, Head of the Planning Department, Lorena Panche, Head of the Infants and Children Education Program, and Librarian Francisco Thaine. According to Marianne Ponsford, CERLALC is an intergovernmental regional institution established in

1971, and it is dedicated to strengthening education for children under five years old and increasing book circulation across Latin America.

Prof. Pan gave a brief account of IKCEST and their trip. Later the delegation made a video presentation to introduce IKCEST's founding philosophy and achievements. Prof. Zhuang Yueting introduced the progress of the CADAL project led by Zhejiang University. Marianne Ponsford spoke highly of the accomplishments made by IKCEST and CADAL. Liu Chang put forward two means of cooperation between CERLALC and IKCEST. One is that CERLALC and other UNESCO C2ICs could join the information and knowledge sharing platform proposed by IKCEST. The other is that CERLALC could take part in the International Training Workshop on "Big Data Technology Application and Knowledge Service" organised by IKCEST, which aims at enhancing data processing capacity of the personnel from UNESCO C2ICs. IKCEST also invited the staff of CERLALC to take part in the international training workshop of IKCEST in 2017. On behalf of the CERLALC, Marianne Ponsford expressed her wish to cooperate with the Chinese Academy of Engineering and Zhejiang University, to participate in the IKCEST international training and to become a contributor to the IKCEST information and knowledge sharing platform and the CADAL program so as to obtain abundant data resources that are useful in Latin America.



National University of Colombia

The delegation paid a visit to the most prestigious university in Colombia - the National University of Colombia on the afternoon of October 14. The university consists of eight campuses, and the main campus is located in Bogota, the capital of the country.

At the university, the delegation met with Prof. María Alejandra Guzmán Pardo, Deputy Director Of Academic Affairs, Prof. Ricardo Emiro Ramírez Heredia of the School of Mechanical Engineering, Prof. Francisco José Román Campos of the School of Electric Engineering, Prof. Leonardo David Donado Garzón of the Institute of Natural Sciences, Francesco Di Prima, Coordinator of International Affairs at the School of Engineering, as well as Jhon Bonilla, Director of Foreign Affairs and Adviser of Strategic Cooperation.

The National University of Colombia pointed out that the university is carrying out joint scientific research with a number of Chinese institutions like the Chinese Academy of Sciences, the Institute of Latin America under the Chinese Academy of Social Sciences, Tianjin Medical University and

South China Agricultural University. Prof. Francisco expressed the hope to cooperate with IKCEST in two regards. The first is to prevent and control secondary disasters caused by thunderstorms and torrential rains, and the second is to help the country remove land mines planted during the civil war. After the delegation returned to China, the professor contacted the Secretariat of IKCEST for further cooperation. At the help of the CAE Division of Environment and Light and Textile Industries Engineering, the Chinese expert has established linkages with the Colombian professor to promote bilateral cooperation. Prof. Pan suggested the National University of Colombia maintain academic communication with the CAE and Zhejiang University, recommend appropriate professors to join IKCEST projects and conduct data and academic exchange in such fields as disaster risk reduction, architecture, environmental science and computer science.

CRESPIAL

The delegation visited the CRESPIAL on the morning of October 18. CRESPIAL is a UNESCO



C2IC approved to be established at the 32nd UNESCO General Conference in October 2003, and it is the first C2ICs dedicated to protecting intangible cultural heritage. CRESPIAL Director Fernando Villafuerte Medina welcomed the delegation, and explained the official definitions of intangible cultural heritage and intangible cultural heritage protection.

Prof. Zhuang shared practical experience of Zhejiang University in protecting the Mo Kao Grotto at Dunhuang. The two sides agreed on three means of cooperation: 1) CRESPIAL hopes to adopt the modern monitoring and data analysis technologies to protect the Machu Picchu Ruins; 2) As the largest provider of intangible cultural heritage information in Latin America, and CRESPIAL hopes to move beyond its role as an information provider and develop knowledge management through cooperation with Chinese partners; 3) CRESPIAL is willing to share intangible cultural heritage information and knowledge related to the nature, earthquake, geography, large ancient buildings, handcraft, performance and social practices. As a representative of IKCEST Secretariat, Liu Chang put forward several ways of cooperation with IKCEST, such as joining its information and knowledge sharing platform and taking part in the international training courses provided by IKCEST to help the trainees improve their data processing capacity. The initiatives were warmly responded by CRESPIAL. Prof. Pan applauded the idea of establishing an international intangible cultural heritage database to collect data from China, Asia and Latin America and support innovative design to create more interesting and novel information.

National University of Saint Anthony the Abbot

The delegation visited the National University of Saint Anthony the Abbot on the afternoon of October 18. The university was established on March 1, 1692 under the proposition of the Pope Innocent XII. It's the oldest university in Peru and the second oldest in South America.

The National University of Saint Anthony the Abbot attached great importance to the meeting with IKCEST delegation. Among the participants were President Dr. Baltazar Nicolas Cáceres Huambo, Vice President of Scientific Research Dr. Gilbert Alagón Huallpa, Vice President of Academic Affairs Dr. Edilberto Zela Vera, Vice President Dr. Manrique Borda Pilinco, Director of International Technology Cooperation Ing. Percy Miguel Rueda Puelles, Director of Public Relations Office Mgt. José Darío Salazar Bragagnini, as well as professors from the School of Information Technology.

Prof. Pan introduced general information of CAE, founding philosophy and objectives of IKCEST, the C2ICs-oriented information and knowledge sharing platform, general information of Zhejiang University and its relationship with IKCEST. Prof. Zhuang introduced College of Computer Science and Technology of Zhejiang University. The National University of Saint Anthony is very willing to establish partnership with the CAE and IKCEST. Prof. Pan advised Agricultural Sub-Centre of CKCEST to establish relations with the School of Agriculture of the university. The National University of Saint Anthony proposed to sign an MoU on strategic partnership with CAE and carry out practical cooperation within that framework.

In conclusion, during this trip, the delegation introduced the founding philosophy and work progress of IKCEST to these institutions and invited them to participate in the international training courses provided by IKCEST. The invitation received positive response from the institutions. CEHICA and IKCEST signed an MoU and agreed to carry out all-round cooperation under the framework. All the institutions are supportive of the conceptions behind the establishment of the C2ICs information and knowledge sharing platform. CERLALC is eager to join the platform and pleased to act as the coordinator of the platform in Iberia and Latin America. CRESPIAL is willing to share intangible cultural heritage information and knowledge

related to large ancient buildings and handcraft. The trip has enhanced IKCEST's popularity and influence, promoted its philosophy and advanced the construction of the information and knowledge sharing platform for UNESCO C2ICs.

The trip has built a bridge to facilitate academic exchange between Chinese and South American universities in the field of engineering, science and technology, and will directly expedite future exchange and cooperation. The National University of Colombia, the best university in the country, expressed its eagerness to work together with the CAE and IKCEST to prevent and control the natural disasters of thunderstorms and torrential rains, and the experts from both sides have established linkages. The National University of Saint Anthony the Abbot expressed the wish to ink a strategic partnership agreement with the CAE and IKCEST, and hoped to cooperate in the fields of agriculture, geography and mining in the first place. Both universities expressed the wish to develop partnership

with the CADAL digital library, and the School of Computer Science and the School of Information Technology have agreed to forge partnership with the College of Computer Science and Technology of Zhejiang University and looked forward to future cooperation.

The trip is practically meaningful for South American academic institutions to embrace digitisation and information technologies as they are struggling to upgrade their backward engineering, science and technology. CRESPIAL hoped to adopt advanced technologies like micro-environmental monitoring, big data analysis and virtual display to protect the world-famous Machu Picchu Ruins, and use big data technologies to preserve intangible cultural heritage. Cerlalc is eager to apply IKCEST's technology that can digitalize physical literature and get access to the CADAL digital library, and hope to become a core partner of CADAL digital library in Latin America.



IKCEST signed MoU with CEHICA

The International Knowledge Centre for Engineering Sciences and Technology under the Auspices of UNESCO (shortened as “IKCEST”) signed an MoU with the National Institute for the Development of Water Resources of the Dominican Republic (shortened as “INDRHI”) and the Centre for the Sustainable Management of Water Resources in the Caribbean Island States (shortened as “CEHICA”) on October 12, 2016. Executive Deputy Director of IKCEST Song Dexiong and Executive Director of CEHICA Ing. Olgo Fernández Rodríguez signed the MoU on behalf of the two sides. Pan Yunhe, Co-Chair of the IKCEST Advisory Committee and member of the IKCEST Governing Board, Fu Xinrong, representative of the Office of Commercial Development of China in Dominican Republic and Zhang Yuehui, President of the Chinese General Chamber of Commerce in Dominican Republic as well as representatives from both sides attended and witnessed the signing ceremony.

When addressing the signing ceremony, Pan Yunhe pointed out that the signing of the MoU

starts a new chapter in the relations between China and the Dominican Republic. He encouraged the two sides to work together to harness the power of advanced information technologies, raise the level of water resources management and hydrology utilisation, build a regional big data centre on water resources, promote information connectivity and data sharing, and make greater contribution to humanity. He hoped the two sides take their cooperation to a new level and deliver more fruitful results. Pan Yunhe also thanked the Office of Commercial Development of China in Dominican Republic for coordinating the visiting arrangements of the Chinese delegation, and acknowledged its important role as a bridge for the development of bilateral relations. He also called on the Chinese General Chamber of Commerce in the Dominican Republic to encourage local Chinese enterprises to take part in the relevant cooperation. In his speech, Ing. Olgo Fernández Rodríguez thanked IKCEST for its contribution to bilateral cooperation, and underscored the importance of the signing of the MoU in





promoting the exchanges, cooperation and coordination between the two centres.

According to the agreement in the MoU, the two sides will make an utmost effort to develop a

long-term partnership and deepen cooperation in such fields as personnel exchange, joint training, joint academic seminars and joint research.

IKCEST conducted survey and study of Engineering Education Knowledge Service System sub-project

The International Knowledge Centre for Engineering Sciences and Technology under the Auspices of UNESCO (shortened as "IKCEST") conducted survey and study of the Engineering Education Knowledge Service System in the XuetangX meeting room of the Science and Technology Tower in Tsinghua University Science Park on October 26, 2016. Song Dexiong, Executive Deputy Director of IKCEST, Liu Chang, Director of Division of International Cooperation of IKCEST, Liu Hongyang and Zhang Ye, Project Managers, Wang Xuanyan, Director of IKCEST Platform Development Team, Liu Wei and Shen Ying, team experts, Wang Sunyu, Secretary-General of the International Centre for Engineering Education under the auspices of UNESCO (shortened as "ICEE"), Li Yue, Deputy Secretary-General, Xie Zheping, Deputy Research Fellow, Ji Biao, Vice President of XuetangX, Shi Xuelin, Deputy Director of the Curriculum Department, Dong Zhi, Curriculum Product Manager and some other staff of ICEE and XuetangX took part in the survey and study.

The meeting was presided over by Secretary-General Wang Sunyu. He first welcomed the

IKCEST delegation and introduced the participants. Vice President Ji Biao provided a briefing on the background, current situation and future vision of XuetangX. He pointed out that XuetangX now ranks top three globally in MOOC websites, and offers over 1,000 courses, with over 6 million registered users. There is a broad space for cooperation with IKCEST. Long Yu from ICEE gave a presentation on the Engineering Education Knowledge Service System, including its background, progress, online contents for 2016 and plans for 2017, especially the progress and development plan of the engineering education database, international engineering online education platform, and global engineering capacity report. Deputy Director Shi Xuelin introduced and demonstrated the MOOC online courses, and showed the audience XuetangX interfaces and functions such as promotion video, course contents, course evaluation and interaction. After that, the experts of IKCEST's Platform Development Team had an exchange of views with the experts of ICEE and XuetangX on the survey questionnaire for the top-level designing demands of the IKCEST general platform, and agreed to have

further communication and coordination on the interface and system architecture. The experts of the Platform Development Team hoped that the users of the IKCEST platform could access MOOC courses without online registration, and suggested that the IKCEST general platform and XuetangX share their personal registration systems so as to simplify the access procedures for users and provide better user experience.

In his concluding remarks, Executive Deputy Director Song Dexiong commended the achievements made in the construction of the Engineering Education Knowledge Service System over the past year and the steady progress on various fronts. He also thanked all the staff for their hard work and encouraged deeper cooperation between IKCEST and ICEE and XuetangX to leverage their comparative strengths. Song Dexiong stressed that

data must come first for knowledge services. He hoped that the Engineering Education Knowledge Service System could strengthen its data resources establishment, create a clear data list, and build a user-oriented and demand-tailored knowledge service system. He also encouraged XuetangX to open itself further to IKCEST, and pledged to use the international influence of the IKCEST platform to promote the MOOC courses of XuetangX. He also suggested that the high-end intellectual resources of the Chinese Academy of Engineering should be utilized to develop MOOC courses given by CAE members, to better promote China's engineering achievements, and create the Chinese model of engineering education.

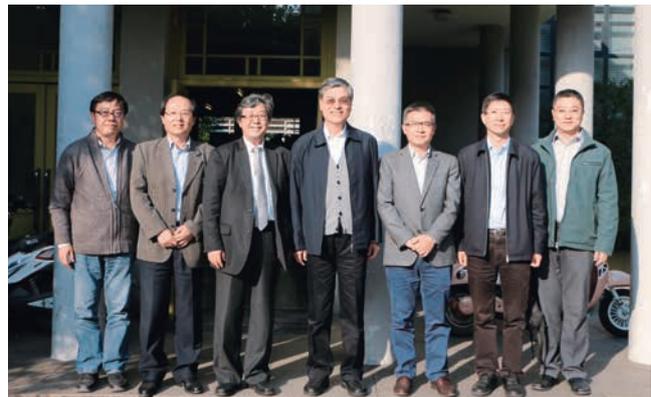
The participants joined for a group photo after the meeting.



IKCEST conducted survey and study of Intelligent City Knowledge Service System sub-project

The International Knowledge Centre for Engineering Sciences and Technology under the Auspices of UNESCO (shortened as “IKCEST”) conducted survey and study of the Intelligent City Knowledge Service System in Meeting Room 219 of Wenyuan Building, Tongji University in Shanghai on November 2, 2016. Prof. Pan Yunhe, Former Executive Vice President of the Chinese Academy of Engineering, Governing Board member of IKCEST and Co-Chair of the IKCEST Advisory Committee, Song Dexiong, IKCEST Executive Deputy Director, Liu Chang, Director of Division of International Cooperation of IKCEST, Ma Yingchen and Zhang Ye,

Project Managers, Wang Xuanyan, Director of, Liu Wei, Shen Ying and Xu Wenjie, experts of IKCEST Platform Development Team, Wu Zhiqiang, Vice President of Tongji University, Peng Zhenwei, Party Secretary of the College of Architecture and Urban Planning (shortened as “CAUP”) of Tongji University and Deputy Director of China Intelligent Urbanisation Co-Creation Centre for High Density Region (shortened as “CIUC”), Zhang Shangwu, Deputy Dean of CAUP and Deputy Director of CIUC, Wang De, Professor of CAUP, Liu Yan, Professor of the School of Software Engineering, Kong Lingyu, CIUC Project Manager and Pei Pei, CIUC Office Di-



rector took part in the survey and study.

Wu Zhiqiang first took the participants on a tour of the CIUC and the big data platform, introduced the background and development goals of CIUC, and showed the innovation outcomes of CIUC and the achievements of the big data platform. Kong Lingyu gave a presentation on the website development of the Intelligent City Knowledge Service System, and introduced the goals and general framework of the project, the progress of website development and data input, the hardware and staff conditions and the plan for the system to go live toward the end of the year. He also demonstrated the database resources, user operation process and back-stage management model of the Intelligent City Knowledge Service System, and explained the specific goals for the launch of the platform. After the introduction, the experts had an exchange of views on the survey questionnaire for the top-level designing demands of the IKCEST general platform, and discussed how to develop a set of unified standards and criteria to incorporate the sub-platforms into the general platform so as to provide better knowledge services for the users. Wang De and Liu Yan introduced the latest research progress made by their teams in mobile phone signal and the big data platform of “intelligent cities”.

Pan Yunhe commended the construction of the Intelligent City Knowledge Service System and called it a project with immense value. He also offered the following suggestions for its future development. First, the functions of searching for the information of world cities must be improved. In addition to the texts and pictures which are already in the system, it is necessary to improve the city information system, develop universally applicable standards and set up an integrated information framework for the researches. Second, there must be a sound evaluation system for intelligent cities, which allows the cities to add and revise their data, provides authoritative evaluation services on city

intelligence, and evaluates the intelligence performance of cities in such aspects as education and transportation. Third, there must be a diagnosis system for intelligent cities to make them the diagnosis more digitalized, networked and intelligent. Leveraging the existing big data on population, the data resources must be further expanded and open to all countries in the world, especially less developed countries. Fourth, a sound urban planning system must be put in place to embrace the age of artificial intelligence 2.0. Building on the existing research basis, further studies must be conducted on the relationship between the current conditions of urban development and the transportation, environment, culture and education prospect of cities in order to cultivate a new model of urbanisation.

Talking about implementation, Song Dexiong pointed out that at the current stage, the Intelligent City Knowledge Service System must focus on connecting the existing knowledge service system with the vision of intelligent cities described by Prof. Pan. In the construction process, attention must be paid to the source and reliability of data and efforts must be made to build a structured database of major international cities with quality data resources and knowledge services. The construction of the platform aims to provide knowledge services on urban planning and export China’s experience to less developed countries in the world. The platform must strive to achieve online and offline connectivity, and offer all-round knowledge training for Asian, African and Latin American countries. The construction of the big data platform has provided a useful experience for the development of the China Knowledge Centre for Engineering Sciences and Technology (shortened as “CKCEST”) and the idea of constructing a CKCEST sub-centre on intelligent cities could be explored in the future. IKCEST will consider step up input as appropriate to ensure the construction of the Intelligent City Knowledge Service System.

IKCEST International Training Workshop 2016 held in Hangzhou

The International Training Workshop 2016, hosted by the International Knowledge Centre for Engineering Sciences and Technology under the Auspices of UNESCO (shortened as “IKCEST”) and co-organised by the College of Computer Science and Technology, Zhejiang University (shortened as “ZJU”) and the Engineering Research Centre of Digital Library, Ministry of Education, was successfully held in Hangzhou from November 2 to 9.

Under the theme “big data technology application and knowledge service”, the program aims to provide training on data processing and analysis for the R&D and management personnel of UNESCO Category 2 Institutes and Centres for the purpose of promoting their capacity building in the

field of engineering technologies. Over 30 trainees of 11 Category 2 Institutes and Centres (shortened as “C2ICs”), from Cameroon, Egypt, Iran, Malaysia and Mexico, took part in the training.

The training workshop consisted of lectures and technical visits. The lectures were organised by the IKCEST Secretariat, ZJU College of Computer Science and Technology, sub-centres and platform development teams of IKCEST, covering such subjects as the general background of the construction and operation of IKCEST, knowledge on big data such as basic structure of big data, depth-first search, cross-media computing and massive visual data analysis, big data application in healthcare, agriculture, education, disaster risk reduction,



intelligent cities and other specialised areas, big data and cloud computing technologies application in different industries, and the development of IKCEST knowledge service systems. The sites for technical visit included the CADAL program of the Zhejiang University Library, cultural exhibition of ZJU Library and the University History Museum of ZJU. Technical discussion and exchanges were also arranged for the trainees after the courses. Through the participation in this program, the trainees have learned more about IKCEST and big data technologies and acquired better solutions to lowering costs, making decisions and increasing efficiency, which could help them better deliver their work in the future.

The opening ceremony of the training workshop was presided over by Liu Chang, Director of Division of International Cooperation of IKCEST. Hans Dencker Thulstrup from the UNESCO Beijing Office, and Song Dexiong, Executive Deputy

Director of IKCEST, delivered speeches. Zhuang Yueting, Dean of ZJU College of Computer Science and Technology, attended the closing ceremony, and issued graduation certificates to the trainees together with the IKCEST Secretariat.

This training workshop is the second training program independently hosted by IKCEST. By providing targeted training for the staff of C2ICs, IKCEST has helped the trainees acquire the ability for data analysis, digging and process, expanded the coverage and influence of training, promoted the mutual understanding among C2ICs, and provided the platform for cooperation between IKCEST and C2ICs and among C2ICs participated the training program. During the technical discussion, several C2ICs offered plans for cooperation with IKCEST in such areas as establishing information and knowledge sharing platform for C2ICs, setting up liaison mechanism, holding joint training programs and jointly developing knowledge services.





IKCEST representatives attended 2016 Beijing International Conference on Northeast Asia Peace and Cooperation Initiative

The 2016 Beijing International Conference on Northeast Asia Peace and Cooperation Initiative (shortened as “NAPCI”) was held in Beijing on November 4, 2016. Experts from the Disaster Risk Reduction Knowledge Service System of the Interna-

tional Knowledge Centre for Engineering Sciences and Technology under the Auspices of UNESCO (shortened as “IKCEST”) was invited to the conference and delivered a special report. IKCEST Project Manager Liu Hongyang and Deputy Research

Fellow of the Northeast Institute of Geography and Agroecology (shortened as “IGA”), Chinese Academy of Sciences (shortened as “CAS”) Bu Kun attended the conference. The conference, which was chaired by the Sejong Institute of the ROK, covered four main subjects, i.e. nuclear security, cybersecurity, disaster management and environmental protection.

IKCEST representatives pointed out that disaster risk reduction is an urgent task for all members of the international community. There is a long-standing commitment of UNESCO to global cooperation in this field. In accordance with the requirements of the DRR Section of UNESCO, IKCEST started the construction of the Disaster Risk Reduction Knowledge Service System in early 2016. Under the system, the relevant parties have conducted research on the formulation of international standards for disaster metadata, developed the prototype system with WEB, geographic information system (shortened as “GIS”) and cloud

computing technologies, collected the data and map resources related to disaster risk reduction in the region, organised international training courses and shared the teaching video.

During the exchange, IKCEST proposed to work with international experts to build an open global metadatabase on disaster, and promote the access and sharing of disaster data such as earthquake, flood and drought in Northeast Asia and the application of these data in the disaster risk reduction of the region. With the support of UNESCO, IKCEST will build an expert network of the Disaster Risk Reduction Knowledge Service System. IKCEST plans to hold an expert seminar on disaster risk reduction knowledge services in November 2017, and looks forward to the participation of international experts in this field. After the meeting, IKCEST representatives and the experts of the Korea Environmental Preservation Association had a further exchange of views. The two sides agreed to deepen their cooperation in the future through consultation.





IKCEST representatives attended UNESCO Collaboration Workshop in Beijing

The UNESCO Collaboration Workshop co-sponsored by the Chinese National Commission for UNESCO (shortened as “the NatCom”) and the UNESCO Beijing Office opened in Beijing from December 6 to 7. Liu Chang, Director of IKCEST Division of International Cooperation, and Zhang Ye from the IKCEST Secretariat, attended the workshop together with some 100 representatives from institutes of intangible cultural heritage, world heritage, creative cities network and UNESCO Category 2 Institutes and Centres (shortened as “C2ICs”) in China.

Du Yue, Secretary-General of the NatCom, delivered a speech on the theme of “enhancing

participation capability and following out the “two overall concerns” on the morning of December 6. He reviewed the history and outcomes of China-UNESCO cooperation, pointed out the cooperation areas where more efforts are required, and encouraged the relevant institutions to build up their capability for participation and make full use of their advantages. Professor Zhang Xiaojing, Dean of the Department of Political Science of Tsinghua University, elaborated on the relationship between international organizations and global governance, the evolution of China’s attitude to global governance and the significance and role of China to



international organizations and global governance, and proposed that China should undertake the role of “defender of values” and “performer of responsibilities” in the course of globalization. Marielza Oliveira, Director of the UNESCO Beijing Office, provided an in-depth analysis of the UNESCO framework and its future development strategy with a report on the theme of “UNESCO’s path of development”.

Five speakers made presentations on the afternoon of December 6. Eunice Smith, project expert of the UNESCO Beijing Office, explained how to engage in international communication more professionally and offered practical communication skills from the perspective of dialogue and exchange. Lu Zhengpin, Deputy Minister of the Publicity Department of the CPC Hangzhou Municipal Committee, introduced the exploratory steps taken by Hangzhou to build creative cities from the perspectives of the development course, bottleneck breaking, and future planning, which offered a case for study to other institutions that are interested in the application for creative cities. Hong Tianhua, Executive Deputy Director and Secretary-General of the International Centre on Space Technologies for Natural and Cultural Heritage under the auspices

of UNESCO (shortened as “HIST”), introduced UNESCO’s strategic objectives, the prospect of cooperation among Belt and Road countries and the progress in the construction of HIST, and analysed how the construction of UNESCO C2ICs could be aligned with the Belt and Road strategy. Peng Liping, Director of the International Centre of Teacher Education of East-China Normal University, introduced the UNESCO Chair in teacher education program in East-China Normal University, and explained how the platform of UNESCO Chair could be used to promote international education. Li Xin, Deputy Secretary-General of the World Heritage Institute of Training and Research for the Asia and the Pacific Region under the auspices of UNESCO, introduced the characteristics of the creative cities network, highlighted the vast potential of and demand for creative cities, and believed China should seize this important period of strategic opportunities.

Four speakers made presentations on the morning of December 7. Ma Wenhui, President of China Intangible Cultural Heritage Protection Association, introduced the current situation and progress of intangible cultural heritage protection, and pointed out that in protecting intangible cultural her-





itage, we should not only explore different means for presenting these unique experience, but also align protection with education to turn intangible cultural heritages into education resources that can benefit future generations. Zhou Jiagui, Deputy Secretary-General of the NatCom, introduced China's propositions for participation in global governance, and put forward suggestions on how to more effectively take part in the governance capacity building of UNESCO. Associate Professor Xie Zheping of the Institute of Education of Tsinghua University introduced the expansion process of the international community, the evolution of UNESCO and its relations with China, and called on the participants to actively engage in international cooperation through the UNESCO platform and better undertake their duties. Guo Zhan, Vice President of Chinese Society of Cultural Relics, President of World Heritage Institute and former Vice President of ICOMOS, spoke on the theme of "cultural confidence and international exchange in heritage protection". Using real cases, he explained the reasons, process and evaluation criteria of heritage application and its impact on countries and cities, and made an appeal to the public to leave cultural heritage, environment and landscape as original as possible to future generations for as long as possible.

On the afternoon of December 7, the heads of various divisions and offices of the NatCom gave a

briefing on their portfolios and major activity plans, which helped the participants gain a better understanding of the various work of UNESCO and their own duties.

In the concluding remarks, Secretary-General Du Yue applauded UNESCO's role as a learning centre, a laboratory of ideas and an organization of intellectual cooperation. For those working on education, science and culture, the most important quality is the curiosity for new knowledge. Three abilities are therefore essential: the ability to lead, i.e. being able to offer one's own opinions and perspectives while properly managing interpersonal relations; the ability to process information, i.e. searching useful information and deleting waste information to make work more efficient; the ability to communicate, i.e. being able to clearly articulate one's ideas with the most concise and accurate words. Secretary-General Du also encouraged the participants to spend more time on reading, form a complete knowledge system, be more innovative, and build a successful career in education, science and culture.

The workshop has enabled the relevant institutions to gain a better understanding of UNESCO and its operation model, enhanced their capability to participate in UNESCO activities, and further expanded and deepened China-UNESCO cooperation in the relevant fields.

IKCEST representative attended HIST evaluation experts meeting

The International Centre on Space Technologies for Natural and Cultural Heritage under the Auspices of UNESCO (shortened as “HIST”) held an experts meeting on the afternoon of December 21, 2016. The meeting was an important part of the six-year evaluation which HIST, based in the Institute of Remote Sensing and Digital Earth of the Chinese Academy of Sciences, accepts from the UNESCO Headquarters. Appointed by UNESCO, Professor S. Marsh from the University of Nottingham undertook as the third party the evaluation work of HIST.

Attending the meeting were representatives of the Department of International Cooperation of the Chinese Academy of Sciences, the Secretariat of the National Commission of China for UNESCO, the State Administration of Cultural Heritage, the Ministry of Science and Technology, the Secretariat of the Chinese National Committee for Man and the Biosphere Programme, the Chinese Academy of

Cultural Heritage, the Office of the UNESCO Global Geoparks Network and other UNESCO Category 2 centres. The representative of the CAE-based International Knowledge Centre for Engineering Sciences and Technology under the Auspices of UNESCO (shortened as “IKCEST”) was present at the meeting. Based on IKCEST’s contact and cooperation experience with HIST, the IKCEST representative commented on the work done by HIST, and the future cooperation paths, and fully recognised HIST’s achievements, its capacity and enthusiasm for participating in international cooperation.

Through exchanges with the evaluation experts both at and after the meeting, the IKCEST representative gained a clearer understanding of the process and specification of the UNESCO six-year evaluation and what the evaluation experts would pay special attention to. This will help to lay a foundation for IKCEST to receive the six-year evaluation of the UNESCO Headquarters in 2020.



IKCEST popularized science knowledge among young people

In order to accommodate the Campaign on “Teenagers Go into the Chinese Academy of Engineering (CAE)” launched by the CAE, the International Knowledge Centre for Engineering Sciences and Technology (IKCEST) was opened to young-

sters on October 14, November 25, December 2, 9, and 23 respectively, in order to introduce the concepts of building the centre and popularize related science knowledge.



» CKCEST News

The China Knowledge Centre for Engineering Sciences and Technology (shortened as “CKCEST”) is a significant part of and vital support for the International Knowledge Centre for Engineering Sciences and Technology (shortened as “IKCEST”).

Inaugural meeting of Strategic Alliance of Big Data Innovation for Engineering Sciences and Technology held in Beijing

The inaugural meeting of the Strategic Alliance of Big Data Innovation for Engineering Sciences and Technology took place in Beijing on September 6, 2016. Zhou Ji, President of CAE, Chen Zuoning, Vice President of CAE, Wu Hao, Deputy Director-General of the Department of High-Tech Industry of National Development and Reform Commission (shortened as “NDRC”) and Zhang Xu, Deputy Director-General of the Department of Innovation and Development of the Ministry of Science and Technology of PRC (shortened as “MOST”) attended the meeting and gave addresses. The meeting was chaired by CAE Secretary-General Wu Guokai and attended by representatives of all member organisations.

At the inaugural meeting, Zhou Ji said: “Big data has become one of the most valuable treasure troves of the new era with wide implications for extensive fields including economy, society, education, health care and government administration and has a great role to play in accelerating economic transformation and government administration transformation and improving social efficiency. The establishment of the alliance in China is an important measure to implement the State Council’s big data development strategy and a big data innovation in its own right for engineering science and technology, and it is a very timely and necessary step.”

At the meeting, CAE Vice President Chen Zuoning was elected as the President of the first Governing Board of the alliance with the unanimous support from all the 20 founding members, and Central Iron & Steel Research Institute President and CAE Member Gan Yong, Zhejiang University President Wu Zhaohui and Inspur Group’s Executive President Wang Baihua were elected as Vice Presidents of the Governing Board. CAE President Zhou Ji issued letters of appointment to all Governing Board members. Chen Zuoning announced the official establishment of the Strategic Alliance of Big Data Innovation for Engineering Sciences and Technology.



2016 MOHRSS training program on “Big Data and Knowledge Service” concluded in Beijing

In accordance with the “Circular of the General Office of the Ministry of Human Resources and Social Security (shortened as “MOHRSS”) on Printing and Issuing the 2016 training program for Knowledge Renewal of Professional and Technical Talent”, the CKCEST Project Management Office organised a training program on “Big Data and Knowledge Service” in Beijing from August 22 to 27.

The program, spanning five days with a total of 40 class hours, was attended by 70 trainees, who received lectures from eight experts and professors from Tsinghua University, Zhejiang University and Inspur Group and sat a written examination. The attendees passed the examination and were granted knowledge renewal training certificates recognised by the MOHRSS. The program ended on August 27. After that, the Project Management Office collected feedback and suggestions from the trainees and summarised the experience, lessons and main achievements of the program for further optimisation of subsequent activities.

Meeting held to advance CKCEST mass entrepreneurship and innovation platform construction

The meeting to advance the construction of the CKCEST's mass entrepreneurship and innovation platform was held at the CAE on September 2, 2016. The meeting was chaired by Song Dexiong, Director of the CKCEST Project Management Office, and attended by relevant personnel of the CKCEST Project Management Office, Sub-Centre for the Manufacturing Industry, Sub-Centre for Innovative Design and the Inspur project group.

First, the Inspur project group for the mass entrepreneurship and innovation platform reported the progress of platform construction and the subsequent work plan. Then the Sub-Centre for the Manufacturing Industry briefed the meeting on the redesign of the mass entrepreneurship and innovation platform of the manufacturing industry and exploration in services implementation based on the platform. Finally, the Sub-Centre for Innovative Design reported the current status of the mass entrepreneurship and innovation platform in terms of innovative design and the subsequent work plan.

Members of the CKCEST Project Management Office and attending experts had discussions on the briefings. In the light of the discussion results, Song Dexiong put forward specific requirements for the subsequent work of the mass entrepreneurship and innovation platform construction:

- (1) Clarify construction milestones, scope of work and outcomes;
- (2) Work out an efficient work mechanism and feasible work plan based on effective coordination and blueprinting;
- (3) Discuss with the sub-centres on launch formats of the CKCEST mass entrepreneurship and innova-

tion platform in the light of offline activities including the “Maritime Silk Road” and “China Good Design” and put relevant content online.

Meeting held to discuss knowledge organisation system and development plan

The meeting was held to discuss the progress of the knowledge organisation system and its construction plan at the CAE on August 18, 2016. The meeting was chaired by Guo Tiecheng, Deputy Director of the Institute of Scientific and Technical Information of China (ISTIC), and attended by Song Dexiong, Director of CKCEST Project Management Office and Deputy Director Pan Gang, and relevant experts from Inspur Group, State Administration of Press, Publication, Radio, Film and Television, Peking University, Zhejiang University, National Geological Library of China, Electronic Technology Information Research Institute under the Ministry of Industry and Information Technology and Wanfang Data Co., Ltd. The attendees had discussions on the current status and development plan of the CKCEST knowledge organisation system. The meeting affirmed the fundamental role played by the knowledge organisation system in the construction of the CKCEST. Song Dexiong asked the relevant organisations to further refine their plans in the light of the suggestions from the experts to make the plans operational in the short term while being in alignment with the overall goals of the CKCEST.

Meeting held at CAE to discuss active information push function

The CKCEST Project Management Office held a meeting in Room 219 of the CAE to discuss the active information push function of the CKCEST platform on September 1, 2016. The meeting was attended by experts of the sub-centres for chemical industry, agriculture, medicine and information technology and development personnel of Inspur Group and chaired by Pan Gang, Deputy Director of the CKCEST Project Management Office. Song Dexiong, Director of the CKCEST Project Management Office, joined meeting discussions. The meeting had thorough discussions on how each feature design would be optimised based on the inputs from all parties including CAE members, service experts, and active information push operators. In view of the urgent need for the active push service, the meeting decided that the functional module of active push should be completed and put into trial operation on independent servers in mid or late September and that Inspur Group should brief the CKCEST Project Management Office and the relevant sub-centres on the development outcomes after September 20 before the active push module is officially put into trial operation.



Discussion seminar on sub-centre appraisal system held in Beijing

The discussion seminar on the CKCEST sub-centre appraisal system was held in Room 220 of the CAE on September 14, 2016, where the taskforce briefed the attendees on the research report of the sub-centre appraisal system and the appraisal system plan. Based on discussions, the meeting concluded that the construction of CKCEST sub-centres should “highlight resources, manifest uniqueness, and focus on service” and that the appraisal of sub-centres should be objective and rigorous. At present, the sub-centre appraisal system plan has been preliminarily confirmed and available for trial application to select sub-centres. The project group will perform a trial appraisal before November 10 and refine the plan based on the results of appraisal.

Advisory service for China AI 2.0 Development Strategy Research smoothly proceeded

To better serve the CAE in major strategic advisory projects and substantiate the CKCEST’s role of providing knowledge service to engineering science and technology personnel, the CKCEST Sub-Centre for Information Technology created the internal reference publication China AI 2.0 Development Strategy Research to provide the “China AI 2.0 Development Strategy Research” project group with information resource push service.

The internal publication consists of three sections, namely domestic and international news, research reports and literature express. To ensure service quality, the sub-centre formed an editorial office responsible for information collection, editing and service. Since its start of service on July 29, 2016, the internal publication has published four issues, sent newsletter in PDF on the 15th and 30th day of each month to the AI project group. The editorial office has received a lot of valuable feedback and suggestions from the CKCEST Project Management Office, CAE members and experts, providing support and assistance for the editorial office to better understand the needs of the project group, grasp the direction of service, and improve the quality of the reference.

In addition, the CKCEST Sub-Centre for Information Technology has tried to publicise the service through the WeChat official account “gongxinzhiku”, a has also received feedback and information requests from other recipients of the reference including Chongqing Branch of MIIT Fifth Electronics Research Institute. Currently, China AI 2.0 Development Strategy Research has achieved a preliminary success in providing the reference service with a further expanded scope of service. The sub-centre will continue to improve the service quality of the internal reference with the focus on users’ needs.

»» Top News for Big Data Era

2016 China International Big Data and Cloud Computing Expo held in Beijing

The 2016 China International Big Data and Cloud Computing Expo and Summits, sponsored by CIIA Big Data Association, Zhongguancun Big Data Industry Alliance, Data Centre Industry Alliance of China and China International Exhibition Centre Group and organised by WendBiz Exhibition Co., Ltd., was held in China International Exhibition Centre in Beijing from August 4 to August 7, 2016.

As the largest and most influential big data and cloud computing expo in north China, the event, initiated by the government and operated as a market-driven event with wide engagement of participants along the entire industry chain, provides a comprehensive platform of communication and linkage that integrates government, capital, industry, application and technical exchange. The 2016 event showcased leading big data and cloud computing technologies, products and solutions from more than 100 exhibitors including China Mobile, China Unicom, China Telecom, JD Cloud, 360, Microsoft, IBM, HYDATA, BOCO Inter-Telecom, CIDS, Runzeke, Faisco and Brilliant Data Analytics and received 11,000 visitors with excellent results in terms of cooperation, communication and exhibition.

During the event, the organising committee, together with a number of partner organisations, held several big data and cloud computing forums, including 2016 Big Data – Beijing-Tianjin-Hebei Summit, 2016 China Big Data and Cloud Computing Summit Forum and Data Centre Customer Service Summit, Power of Data in Finance – Big Data for Finance Development Summit Forum, the 4th China Data Analytics Industry Summit, Big Data + Enterprise Applications Forum, and Internet+ Mobile Marketing Summit Forum. At these forums, attendees including government officials, academicians, experts, and industry leaders as well as more than 2,000 representatives from enterprise users, industry insiders, investment institutions, channels and media had comprehensive discussions on hot industry topics, emerging technologies and new products from different perspectives, which strongly promoted big data applications and the development of the big data industry.

Source: china.com.cn

Beijing Big Data and Cloud Computing Development Action Plan (2016-2020) released

Beijing Municipal Government released the “Beijing Big Data and Cloud Computing Development Ac-



tion Plan (2016-2020)” in August 2016. According to the plan, Beijing will, within one or two years, establish an identity card-based electronic document database to provide secure related services, delivering “acceptance at one window, sharing on one platform, service at one stop and handling on one Net”. By 2020, more than 90% of government departments will make their public data publicly available, accounting for more than 60% of all public data. By then, the city will have in place a mechanism where “openness is the norm, not the exception”.

The action plan also stated that Beijing will establish a big data and cloud computing innovation and development system by 2020, becoming China’s hub of big data and cloud computing innovation centres, application centres and the entire big data and cloud computing industry. The city will build more than ten big data and cloud computing innovation application demonstration projects, increase the number of big data and cloud computing companies to more than 500, and foster an RMB 100 billion worth industry cluster as a new major driver of the capital’s economic growth.

Source: Beijing Daily

2016 China Big Data Technology and Application Symposium and Alliance Inauguration Meeting held in Beijing

The 2016 China Big Data Technology and Application Symposium and Alliance Inauguration Meeting was held in Beijing on August 25, 2016. The event was directed by the Ministry of Industry and Information Technology and China Association of Communications Enterprises (CACE) and organised by the CACE Special Committee for Communications Network Operation, Beijing University of Posts and Telecommunications, Academic Committee of China Academy of Management Science and China Big Data Technology and Application Alliance.

As China’s big data industry increasingly matures with substantially enhanced network infrastructure and a more and more centralised network of large-scale data centres, the country’s cloud computing industry has also become more specialised and sophisticated. According to statistics, the cloud computing industry led to more than RMB 350 billion of revenues in upstream and downstream industries, which, while providing a strong support of big data development, attracted the attention of the capital market and the general public, thus forming a virtuous cycle of big data development. In spite of this progress, big data development in China still faces quite a few challenges and bottlenecks, especially in terms of information access and sharing, innovation, regulation, standards, and human resources. The most prominent among them are information silos and lack of open-source support, which have become big barriers to the development of the industry.

It is against this backdrop that the China Big Data Technology and Application Alliance has been established, whose primary mission is to advance interchange of big data, unify data definitions, formats, interfaces, and security standards, work towards greater openness of technologies and data resources held by enterprises and governments at various levels, promote cooperation of enterprises along the industry chain, and create more cooperation models and business value.

Source: ce.cn

»» Terms on Big Data

Knowledge Graph

Knowledge Graph: a technology that employs visualisation methods to present knowledge resources and their media in the form of a search term centred semantic network where information about the search term and other information it relates to in one way or the other are structurally arranged based on data mining, analysis, construction, mapping and presentation, used in knowledge services such as deep search, Q&A and online learning. It is a systematic way of putting facts, people and places together, to create interconnected search results that are more accurate and relevant. Knowledge graph is an advanced stage of CKCEST's effort to build its knowledge organisation system. Knowledge graph support is one of the advanced functions to be offered by the professional knowledge service sub-centres of the CKCEST.



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