HRH Princess Maha Chakri Sirindhorn
Graciously Presided
over a Group Photograph
with Members of the Interdisciplinary Network
of the Royal Institute of Thailand.
Then on 31 May 2007,
HRH Princess Maha Chakri Sirindhorn Graciously
Accepted the Network
to Be under Her Royal Patronage.
International Journal of the Computer, the Internet and Management

Editor-in-Chief: Srisakdi Charmonman

Proceedings of the
First International Conference on Interdisciplinary Research and Development
Thailand, 1 June 2011

Organized by

The Interdisciplinary Network of the Royal Institute of Thailand
Under the Royal Patronage of HRH Princess Maha Chakri Sirindhorn
The Interdisciplinary Network Foundation for Research and Development

Supported by

The College of Internet Distance Education, Assumption University
Mahasarakham Business School, Mahasarakham University
Khonburi Sugar Public Company Limited
Viboonsiri Co., Ltd.
Thailand Chapter of the Computer Society of the IEEE
Thailand Chapter of the Internet Society
Thailand Chapter of the ACM
Prof.Dr. Srisakdi Charmonman Foundation
Thailand Internet Association
Association of Thai Internet Industry
Asia-Pacific eLearning Association
The Internet Poll Association
The Association of Thai Federation of Information Processing
Opening Address by H.E. Air Chief Marshal Kamthon Sindhvananda, the Privy Councilor

I am most delighted that the Interdisciplinary Network of the Royal Institute of Thailand Under the Royal Patronage of HRH Princess Maha Chakri Sirindhorn with the support of Thailand Chapter of Computer Society of the IEEE, Thailand Chapter of the ACM, Thailand Chapter of the Internet Society, and other related societies, is organizing the Interdisciplinary Day Conferences including The First National Conference on Interdisciplinary Research and Development, and The First International Conference on Interdisciplinary Research and Development.

I would like to offer my heartiest welcome to researchers and developers in the field of interdisciplinary research and development who are gathering in Thailand today to share their innovative research and development ideas.

I am delighted to hear that there are 129 papers from 22 countries in the International Conference. I am very exited by the opportunities the interdisciplinary research and development will provide for the betterment of societies at all levels in the world.

The benefits of the vast expansion of opportunity for interdisciplinary research and development are obvious. Our social and political life will draw critical strength from interdisciplinary research and development. This First International Conference on Interdisciplinary Research and Development thus has wide-ranging implications for the world of tomorrow.

I, therefore, would like to declare this Conference open and thank all the supporting organizations and members of the Organizing Committee led by Prof. Dr. Srisakdi Charmonman for their hard work, as well as thanking all the participants for their significant contributions to the Conference’s success.

K. Sindhvananda

(H.E. Air Chief Marshal Kamthon Sindhvananda) Privy Councilor
PROGRAMMES

UNDERGRADUATE PROGRAMMES:
- Bachelor of Accountancy
- Bachelor of Economics (Business Economics)
- Bachelor of Business Administration (Business Computing)
- Bachelor of Business Administration (Business Information Technology)
- Bachelor of Business Administration (Electronic Commerce Management)
- Bachelor of Business Administration (Entrepreneurship Management)
- Bachelor of Business Administration (Financial Management)
- Bachelor of Business Administration (Human Resource Management)
- Bachelor of Business Administration (General Management)
- Bachelor of Business Administration (Marketing)
- Bachelor of Business Administration (International Business) – International Programme

MASTERS PROGRAMMES:
- Master of Accounting
- Master of Economics (Business Economics)
- Master of Business Administration (M.B.A.) (General Management, Business Information Technology Management, Marketing Management, Strategic Management)
- Master of Management

PH.D. PROGRAMMES:
- Ph.D. in Accounting
- Ph.D. in Management
- Ph.D. in Marketing Management

ADDRESS:
Mahasarakham Business School, Mahasarakham University, Khamrieng, Mahasarakham THAILAND 44150
Email: apply@acc.msu.ac.th Tel: ++66 43 754333 ext 3409
Message from
His Excellency Mr. Abhisit Vejjajiva
Prime Minister of the Kingdom of Thailand

The Royal Thai Government recognizes that an interdisciplinary approach is the key to successful research and development required for the well-being and prosperity of our peoples. The Government is strongly committed to investing in interdisciplinary research and development and in staying competitive, so it has encouraged development in such areas.

I am delighted to learn that the Interdisciplinary Network of the Royal Institute of Thailand under the Royal Patronage of HRH Princess Maha Chakri Sirindhorn organised the First International Conference on Interdisciplinary Research and Development on 1 June 2011 and that 154 papers from 23 countries were submitted. The topic of the Conference was indeed important, as countries around the world use the interdisciplinary approach to solve all kinds of problems and to embark on research and development.

May I congratulate the participants of the Conference and members of the Organising Committee, in particular the chairman, Prof. Dr. Srisakdi Charmonman, for this very successful event.
The Royal Institute of Thailand has established the Interdisciplinary Network since 2004 with the prime goal of creating the academic coordination of academicians and researchers from various domestic and oversea organizations. Additional goal is to create working groups and to share knowledge and ideas from several disciplines in order to give rise to the participation of interdisciplinary researches and development. Moreover, the Royal Crown Princess approved the Interdisciplinary Network of the Royal Institute of Thailand to become Under the Royal Patronage of the HRH Princess Maha Chakri Sirindhorn on May 31st, 2007. The committee on the Interdisciplinary Research and Development deeply appreciates her generosity and kindness. In this regard, the committee generated 7 regional networks as the centers for promoting interdisciplinary research and development in order to solve the problems in the concerned areas. The works in some regional networks have progressed and some have come to the conclusion with the academic outcome for presentation to public. Consequently, the committee will hold the First International Conference on Interdisciplinary Research and Development under the theme on “Interdisciplinary Approach to Research and Development” during May 31st to June 1st 2011 to celebrate the forth anniversary of establishment on the interdisciplinary network under the Royal Patronage of the HRH Princess. The other essential aims are to take this opportunity for the researchers in this region to present his or her work on this occasion, to make academic services to the society, and to collaborate and present their research works with foreign researchers. It is hoped that this will develop multidisciplinary approaches and create academic collaboration in the future. Therefore the objectives of this conference are to share knowledge and advances in interdisciplinary research and development, to build networks of professionals, researchers, educators and policy-makers practicing interdisciplinary research and development, to expand the opportunity for knowledge interchange, to facilitate knowledge-sharing for ongoing initiatives, and to build repositories of current practices and lessons learned.

Activities in this conference will include description, discussion, and presentation on the researches performed by academicians from both in-houses and overseas. The conference will continue smoothly and efficiently because the committee has the great collaboration with researchers within this region and academicians not only form governmental sectors but also from private sectors. These persons whose names cannot be called upon are therefore thanked for their kind and valuable contributions.

(Prof. Dr. med. Yongyudh Vajaradul)
Chairman of the Interdisciplinary Network
of the Royal Institute of Thailand
Message from the Chairman of the Organizing Committee

In my capacity as the Chairman of the Organizing Committee, all members of the Committee would like to express our highest gratitude to H.E. Air Chief Marshal Kamthon Sindhvananda, Privy Councilor, for the kindness in accepting our invitation to chair the opening ceremony of the First International Conference on Interdisciplinary Research and Development.

The main theme of the Conference is “Interdisciplinary Approach to Research and Development.”

The objectives of the Conference are to share knowledge and advances in Interdisciplinary Research and Development, to build networks of professionals, researchers, educators and policy-makers practicing Interdisciplinary Research and Development, to expand the opportunity for knowledge interchange, to facilitate knowledge-sharing for ongoing initiatives, and to build repositories of current practices and lessons learned.

Interdisciplinary Research and Development (IR&D) are research and development that involve interaction among two or more disciplines. IR&D is needed to meet the demand of problems that cannot be solved by using any single discipline. Sample disciplines are Arts, Biological Sciences, Biomedical Sciences, Business Administration, Clinical Sciences, Communications Sciences, Earth and Environmental Sciences, Economics, Education, Health Sciences, Engineering, Information Technology, Internet Technology, Material Sciences, Law and Legal Studies, Mathematical Sciences, Media and Journalism, Natural Sciences, Physical Sciences, Politics and Sociology, Psychology, Public Administration, Religious Studies, Social Sciences, Telecommunications, and any other related topics.

From www.easychair.org, 154 papers from 23 countries were submitted. Three referees were assignment to each paper. Finally, 129 papers from 22 countries were accepted for presentation at the Conference.

We would like to express our sincere appreciation to Mahasarakham Business School of Mahasarakham University, Khonburi Sugar Public Company Limited and Viboonsiri Company Limited for sponsoring the Conference and to all other organizations for supporting the Conference.

Again, we would like to express our gratefulness to H.E. Air Chief Marshal Kamthon Sindhvananda, Privy Councilor, for his kindness in Chairing the Opening Ceremony and deliver the Opening Address.

(Prof. Dr. Srisakdi Charmonman)
Chairman of the Organizing Committee
Message from the Dean of Mahasarakham Business School
Mahasarakham University

The interdisciplinary approach has become the very crucial and challenging technique in the research and development. It has integrated diverse knowledge and skills in order to achieve the goal of knowledge creation. Thus, as the dean and the representative of Mahasarakham Business School, it is our great honor and privilege to be part of the success of both the First National Conference on Interdisciplinary Research and Development and the First International Conference on Interdisciplinary Research and Development.

Furthermore, all of the innovative research and the development of idea could be seen in this Proceeding of the First International Conference on Interdisciplinary Research and Development which comprise of 154 articles from 23 countries. These invaluable articles will also be published in the International Journal of the Computer, the Internet and Management (IJCIM).

Mahasarakham Business School has long served the community in delivering knowledge and academic advices especially in the fields of research and development. As consequence, we have considered putting our efforts in contributing to the development of interdisciplinary research and development in Thailand as our great opportunity to enhance our knowledge which I am sure it will be the huge advantage for further development of our research and teaching activities.

I, therefore, would like to express my appreciation to the Interdisciplinary Network of the Royal Institute of Thailand Under the Royal Patronage of HRH Princess Maha Chakri Sirindhorn, with the supports of many organizations, in realizing the importance of interdisciplinary research and development, as well as, thanking all of the contributors for the success of the conference.

(Associate Professor Dr. Phapruke Ussahawanitchakit)
Dean of Mahasarakham Business School, Mahasarakham University, Thailand
Foreword
The First International Conference on Interdisciplinary Research and Development

The International Journal of the Computer, The Internet and Management (IJCIM) is delighted to publish the Proceedings of the First International Conference on Interdisciplinary Research and Development as the Special Issue of Volume 19, with 154 papers submitted from 23 countries. Then, 129 papers from 22 countries were accepted for presentation at the Conference. From the 129 papers, 17 papers were selected to be published in full in the Proceedings. For the remaining 112 papers, Abstracts are included in the Proceedings and the full papers may be downloaded from www.INRIT2011.com.


In my capacity as the Editor-in-Chief of IJCIM, I would like to thank those who have made the Conference and Proceedings possible. The main organizers are the Interdisciplinary Network of the Royal Institute of Thailand Under the Royal Patronage of HRH Princess Maha Chakri Sirindhorn and the Interdisciplinary Network Foundation for Research and Development. The supporting organizations are the College of Internet Distance Education of Assumption University, Mahasarakham Business School of Mahasarakham University, Khonburi Sugar Public Company Limited, and Viboonsiri Co., Ltd. as well as nine learned societies, namely, Thailand Chapter of the Computer Society of the IEEE, Thailand Chapter of the Internet Society, Thailand Chapter of the ACM, Prof.Dr. Srisakdi Charmonman Foundation, Thailand Internet Association, Association of Thai Internet Industry, Asia-Pacific eLearning Association, The Internet Poll Association, and the Association of Thai Federation of Information Processing. Finally, I must also thank all members of the Organizing Committee, as well as the staff of the Office of Vice President for Information Technology of Assumption University, staff of the College of Internet Distance Education, and staff of the IJCIM.

(Prof. Dr. Srisakdi Charmonman)
Editor-in-Chief of IJCIM
Srisakdi Charmonman IT Center, Assumption University of Thailand
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