

RGC Ref. No.: UGC/IIDS16/E01/21 (please insert ref. above)
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**RESEARCH GRANTS COUNCIL  
COMPETITIVE RESEARCH FUNDING SCHEMES FOR  
THE LOCAL SELF-FINANCING DEGREE SECTOR**

**INTER-INSTITUTIONAL DEVELOPMENT SCHEME (IIDS)**

**Completion Report**  
(for completed projects only)

**Submission Deadlines:** 1. The unspent balance, if applicable, and auditor's report: within six months of the approved project completion date.  
2. Completion report: within 12 months of the approved project completion date.

**Part A: The Project and Investigator(s)**

**1. Project Title**

Digital Revolution Blockchain Technology for facilitating trusted data exchange for  
Jewellery Industry

**2. Investigator(s) and Academic Department(s) / Unit(s) Involved**

Research Team	Name / Post	Unit / Department / Institution
Principal Investigator	Dr TANG Fanny Wai-fan/ Assistant Professor	Department of Science, School of Science and Technology, Hong Kong Metropolitan University
Co-Principal Investigator(s)	Dr LI Jimmy Chi-ho/ Assistant Professor	Department of Science, School of Science and Technology, Hong Kong Metropolitan University
	Dr HO To-sum/ Associate Professor	Department of Supply Chain and Information Management, School of Decision Sciences, The Hang Seng University of Hong Kong
Co-Investigator(s)	Dr MAK Shu-lun/ Honorary Assistant Professor	Department of Science, School of Science and Technology, Hong Kong Metropolitan University
	Dr. WU Jack Chun-ho/ Assistant Professor	Department of Supply Chain and Information Management, School of Decision Sciences, The Hang Seng University of Hong Kong
	Dr CHIU Winnie Wai-hang/ Lecturer	Department of Science, School of Science and Technology, Hong Kong Metropolitan University

	Ms. KWOK Celia Sze-nga/ Assistant Lecturer	Department of Science, School of Science and Technology, Hong Kong Metropolitan University
Others		

### 3. Project Duration

	<b>Original</b>	<b>Revised</b>	<b>Date of RGC / Institution Approval (must be quoted)</b>
Project Start Date	1 January 2022		
Project Completion Date	31 December 2022	31 March 2023	28 April 2022
Duration ( <i>in month</i> )	12 months	15 months	28 April 2022
Deadline for Submission of Completion Report	31 December 2023	31 March 2024	28 April 2022

4.4 Please attach photo(s) of acknowledgement of RGC-funded activities.

**Organizers:**



香港都會大學  
科技學院  
Hong Kong Metropolitan University  
School of Science and Technology



供應鏈及資訊管理學系  
DEPARTMENT OF SUPPLY CHAIN AND  
INFORMATION MANAGEMENT  
香港都會大學  
THE HONG KONG UNIVERSITY  
OF HONG KONG

## Seminar on Blockchain Technology for Facilitating Trusted Data Exchange for Jewellery Industry (First seminar)

**Date:** 3:00 – 5:00 pm  
(GMT+8 Hong Kong)  
30 Jun 2022 (Thu)




**Dr Lore Kiefert**  
Gemology Consulting  
“The Impact of Blockchain  
Technologies on  
Gemstone Testing”




**Ir Dr Tony LEE**  
Assistant Professor cum Acting Head,  
Department of Construction and  
Quality Management,  
School of Science and Technology,  
Hong Kong Metropolitan University,  
HKSAR, China  
“Opening Speech”




**Dr Colin Lee Chi Kin**  
Digital Buildrise , Founder  
“A Sharing the Blockchain  
in Customs and  
Jewellery Industry”



**Prof. Kim Hua TAN**  
Professor, Nottingham University Business School  
“Case Study on the Enhancement  
of Transparency and Compliance:  
Blockchain Adoption to Empower  
Ugandan Small Holder Hot Pepper  
Farmers”



**Ir Dr Fanny TANG**  
Assistant Professor cum Programme Leader,  
Doctor of Engineering / BSc/ BSc (Hons)  
in Product Design, Testing and Certification,  
Department of Construction and  
Quality Management,  
School of Science and Technology,  
Hong Kong Metropolitan University,  
HKSAR, China  
“Panel Discussion”

**Registration**



**Registration Link:**  
<https://forms.gle/FKEyNVLWJm2k8NAq8>

 [iids\\_bc@hkmu.edu.hk](mailto:iids_bc@hkmu.edu.hk)  
 (852) 3120 2732

**Acknowledgment:**  
This seminar is substantially supported by a grant from the  
Research Grants Council of the Hong Kong Special Administrative Region,  
China (UGC/IIDS16/E01/21).

Figure 1- First seminar (30 June2022)

## Organizers:

**mu** 香港都會大學  
科技學院  
Hong Kong Metropolitan University  
School of Science and Technology

供應鏈及資訊管理學系  
DEPARTMENT OF SUPPLY CHAIN AND  
INFORMATION MANAGEMENT  
香港都會大學  
THE HONG KONG METROPOLITAN UNIVERSITY  
OF HONG KONG

## Supporting Organizations:

**APGS**  
Asia Pacific Gemmologist Society  
亞太寶石學家協會有限公司

**Inst MC**  
Institute of Measurement and Control

**HKAE**  
THE HONG KONG  
INSTITUTE OF ENGINEERS  
香港工程師學會

**HKAE**  
THE HONG KONG  
INSTITUTE OF ENGINEERS  
Control, Automation & Instrumentation Division  
控制・自動化及儀器學系

**HKIE**  
THE HONG KONG  
INSTITUTE OF ENGINEERS  
Manufacturing, Industrial & Systems Division  
製造・工業及系統學系

## Seminar on Blockchain Technology for Facilitating Trusted Data Exchange for Jewellery Industry (Second seminar)

**Date:** 3:00 – 5:00 pm  
(GMT+8 Hong Kong)  
30 Sep 2022 (Fri.)

**Registration Link:**  
<https://forms.gle/QyFrMcq3jRUmgBRGA>

**Registration**



### Ir Dr Tony LEE

Assistant Professor cum Acting Head,  
Department of Construction and  
Quality Management,  
School of Science and Technology,  
Hong Kong Metropolitan University,  
HKSAR, China

**“Opening Speech”**



### Dr Daniel Nyfeler

Managing Director of Gübelin Gem Lab

**“Provenance Proof  
Blockchain, the  
industry standard  
for tracking gemstones  
from the mine to the  
final customer”**



### Dr Dominic Mok

DBA, MSc, FGA, FGAA, DGA, AGA (Expert)  
Founder & Principal of Asian Gemmological  
Institute & Laboratory Limited (AGIL)  
Expert Gemmologist

**“Brief Review of  
Advanced Gem  
Testing Technology  
in Hong Kong”**

### Ir Dr Fanny TANG

Assistant Professor cum Programme Leader,  
Doctor of Engineering / BSc/ BSc (Hons)  
in Product Design, Testing and Certification,  
Department of Construction and  
Quality Management,  
School of Science and Technology,  
Hong Kong Metropolitan University,  
HKSAR, China

**“Panel Discussion”**

@ iids\_bc@hkmu.edu.hk

(852) 3120 2732

#### Acknowledgment:

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Research Grants Council of the Hong Kong Special Administrative Region,  
China (UGC/IIDS16/E01/21).

Figure 2- Second seminar (30 September 2022)



**Organizers:**

香港都會大學  
科技學院  
Hong Kong Metropolitan University  
School of Science and Technology

香港科技大學  
DEPARTMENT OF SUPPLY CHAIN AND  
INFORMATION MANAGEMENT  
香港科技大學  
THE HONG KONG UNIVERSITY  
OF SCIENCE AND TECHNOLOGY

**Supporting Organizations:**

THE HONG KONG  
INSTITUTE OF ENGINEERS  
Manufacturing, Industrial & Systems Division  
香港工程師學會  
製造、工業及系統分會

Inst  
MC  
Institute of Measurement and Control

THE HONG KONG  
INSTITUTION OF MEASUREMENT AND  
AUTOMATION  
The Hong Kong Institution of Measurement and Automation

IET  
The Institution of  
Engineering and Technology

**Seminar on**

## Blockchain Technology for Facilitating Trusted Data Exchange for Jewellery Industry

**Third seminar - New Digital Transformation Trends and  
Developments in Operations, Services, and Retailing**

**Date:** 3:00 – 5:00 pm  
(GMT+8 Hong Kong)  
11 Nov. 2022 (Fri.)

**Registration Link:**  
<https://forms.gle/4FKLWmSbUU5hcFo7>

**Registration**

**Ir Dr Tony LEE**  
Assistant Professor cum Acting Head,  
Department of Construction and  
Quality Management,  
School of Science and Technology,  
Hong Kong Metropolitan University,  
HKSAR, China

**“Opening Speech”**

**Dr Wafaa Ahmed**  
Assistant Professor in Information Systems  
Department of Operations Management  
and Information Systems  
Nottingham University Business School  
University of Nottingham

**“Blockchain Technology  
Applications for Supply  
Chain Traceability”**

**Dr Harry Chow**  
Principal consultant of  
Vantis Solutions Limited

**“Application cases  
sharing of digital twin  
and metaverse for  
manufacturing and  
retailing.”**

**Ir Dr Fanny TANG**  
Assistant Professor cum Programme Leader,  
Doctor of Engineering / BSc/ BSc (Hons)  
in Product Design, Testing and Certification,  
Department of Construction and  
Quality Management,  
School of Science and Technology,  
Hong Kong Metropolitan University,  
HKSAR, China

**“Panel Discussion”**

**Dr George Ho**  
Associate Professor of Supply Chain and  
Information Management,  
Associate Programme Director of Business  
Administration in Supply Chain Management Programme,  
Director of Big Data Intelligence Centre,  
Associate Director of Centre for Teaching and Learning,  
the Hang Seng University of Hong Kong,  
HKSAR, China

**“Closing Remarks”**

[iids\\_bc@hkmu.edu.hk](mailto:iids_bc@hkmu.edu.hk)

(852) 3120 2732

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Figure 3 - Third seminar (11 November 2022)

IIDS8 (Oct 2019)

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## Organizers:



## Supporting Organizations:



## Seminar on Blockchain Technology for Facilitating Trusted Data Exchange for Jewellery Industry

Fourth seminar -

Seminar on Artificial Intelligence and Machine Learning for Jewellery Industry

**Date:** 3:00 – 5:00 pm  
(GMT+8 Hong Kong)  
13 Jan. 2023 (Fri.)

**Registration Link:**

<https://forms.gle/m2WVtmyGbmTBj3HV6>

**Registration**



### Ir Dr Tony LEE

Assistant Professor cum Acting Head,  
Department of Construction and Quality Management,  
School of Science and Technology,  
Hong Kong Metropolitan University, HKSAR, China

**“Opening Speech”**

### Professor Asim TEWARL

Professor in the Department of  
Mechanical Engineering,  
Faculty member of the Center for Machine  
Intelligence and Data Science (C-MINDS),  
The Indian Institute of Technology Bombay, Mumbai

**“The convergence of  
Engineering and Machine  
Learning: A new paradigm in  
jewellery industry”**

### Mr Keith KWOK

Senior Project Manager (IT Dept),  
Ka Shui International Holdings Limited,  
HKSAR, China

**“Industry 4.0 and the  
impacts of IIoT in the  
manufacturing industry”**

### Ir Dr Fanny TANG

Assistant Professor cum Programme Leader,  
Doctor of Engineering / BSc/ BSc (Hons)  
in Product Design, Testing and Certification,  
Department of Construction and Quality Management,  
School of Science and Technology,  
Hong Kong Metropolitan University, HKSAR, China

**“Panel Discussion”**

### Dr George HO

Associate Professor of Supply Chain and  
Information Management,  
Associate Programme Director of Business  
Administration in Supply Chain Management Programme,  
Director of Big Data Intelligence Centre,  
Associate Director of Centre for Teaching and Learning,  
the Hang Seng University of Hong Kong, HKSAR, China

**“Closing Remarks”**

#### Acknowledgment:

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Research Grants Council of the Hong Kong Special Administrative Region,  
China (UGC/IIDS16/E01/21).

@ [iids\\_bc@hkmu.edu.hk](mailto:iids_bc@hkmu.edu.hk)

(852) 3120 2732

Figure 4- Fourth seminar (13 January 2023)



# International Symposium on Blockchain Technology and Digitization for Industrial and Professional Economy

**3rd March 2023** | **Hong Kong Metropolitan University**  
E0313, 3/F, The Jockey Club (JCC), Hong Kong Metropolitan University,  
81 Chung Hau Street, Ho Man Tin, Kowloon

## SPEAKERS



**Dr. Lore Kiefert**  
Gemmology Consulting  
Topic: *Traceability and Transparency on Gemstone Testing*



**Prof. Kim Hua TAN**  
Professor, Nottingham University Business School  
Topic: *Building Supply Chain Resiliency with Digitalisation for Practitioners and Policy Makers*



**Dr Anne O'Grady**  
Principal Lecturer, Continuing Professional Education, Nottingham Institute of Education  
Topic: *Knowledge Exchange between Academic and Professional Communities*



**Dr Verity Aiken**  
Senior Lecturer in Education, Nottingham Trent University  
Topic: *The role of the Professional Doctorate for Professional Communities*



**Mr. Danny Chau**  
Managing Director, Front Top Jewelry Manufacturing Limited  
Topic: *The Application and Future Trends of Technology in Jewellery Industry*



**Mr. Kevin Kam**  
Chief Technology Officer, Pivotal Technologies Limited  
Topic: *The Application of Blockchain and AI in Wine Trading Industry*

**Hybrid  
Conference**

**Free of charge!**

**Registration**



@ iids\_bc@hkmu.edu.hk

(852) 3120 2732

**Organizers:**



香港都會大學  
科學園  
Hong Kong Metropolitan University  
School of Science and Technology



供應鏈及資訊管理學系  
DEPARTMENT OF SUPPLY CHAIN AND  
INFORMATION MANAGEMENT  
香港都會大學  
THE HONG KONG METROPOLITAN  
UNIVERSITY OF HONG KONG

**Supporting Organizations:**



The Institution of  
Engineering and Technology



THE HONG KONG  
INSTITUTION FOR ENGIN-  
EERING



THE HONG KONG  
INSTITUTE OF ENGINEERS



Institute of Measurement and Control



The Hong Kong Institution of Measurement and Automation



廣東省測量和標準技術研究院

**Acknowledgment:**  
This seminar is substantially supported by a grant from the Research Grants Council of the Hong Kong Special Administrative Region, China (UGC/IIDS16/E01/21).

Figure 5- International Symposium (3 March 2023)

IIDS8 (Oct 2019)

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## **Part B: The Final Report**

### 5. Collaboration with Other Self-Financing Degree-Awarding Institutions

	<b>Name of Institution(s)</b>	<b>% of Participation</b>	<b>Distinctive <u>Element(s)</u> of the Institution in Responsible Project</b>
<b>Applying Institution</b>	Hong Kong Metropolitan University	90%	<ul style="list-style-type: none"> <li>• Organize and arrange the project events</li> <li>• Act as a bridge to link up different collaborative and interested parties</li> <li>• Invite students, academics and industrialists to join the events</li> </ul>
<b>Collaborating Institution(s) (If any) <sup>#</sup></b>	The Hang Seng University of Hong Kong	10%	<ul style="list-style-type: none"> <li>• Act as a bridge to link up different collaborative and interested parties</li> <li>• Invite students, academics and industrialists to join the events</li> </ul>
<b>Total:</b>		<b>100%</b>	

<sup>#</sup> If no other eligible local self-financing degree-awarding institutions are involved, please input "N/A" in this table.

### 6. Project Objectives

#### 6.1 Objectives as per original application

1. To organise research seminars for consumers, scholars, industrial practitioners and professional institutions in order to provide insight and broaden the knowledge on the of blockchain evolution, gemmological science, smart design and visualization, jewellery authenticity, evolving supply chain management for the jewellery industry and the transformation to Industry 4.0.
2. To organise an international symposium as a collaboration platform for sharing ideas and knowledge for of blockchain evolution, gemmological science, smart design and visualization, and jewellery authenticity, evolving supply chain management for the jewellery industry and the transformation to Industry 4.0, and publish the selected papers.

#### 6.2 Revised objectives

Date of approval from the RGC: N/A

Reasons for the change: N/A



### 6.3 Realisation of the objectives

*(Maximum 1 page; please state how and to what extent the project objectives have been achieved; give reasons for under-achievements and outline attempts to overcome problems, if any)*

- a) The first objective is to provide a learning platform to the relevant stakeholders for enhancing their technical knowledges and gain more knowledge and development skills through seminars. Project team has successfully organised four seminars to invite prominent local and overseas scholars to speak the following major topics.

**First seminar:** The latest blockchain technology and platform development

Date of event: 30 June 2022

**Second seminar:** Gemmological science, smart design and visualization, jewellery authenticity technology

Date of event: 30 September 2022

**Third seminar:** Supply chain management and industry initiatives for jewellery industry

Date of event: 11 November 2022

**Fourth seminar:** Machine learning, artificial intelligence and Industry 4.0 of jewellery industry

Date of event: 3 January 2023

- b) The second objective is to organise an international symposium as a collaboration platform for sharing ideas and knowledge for of blockchain evolution, gemmological science, smart design and visualization, and jewellery authenticity, evolving supply chain management for the jewellery industry and the transformation to Industry 4.0, and publish the selected papers.

Project team has successfully organised an international symposium on 3 March 2023 and the main theme is “Blockchain Technology and Digitization for Industrial and Professional Economy”. Oversea and local speakers are invited for sharing the following topics.

- The Application and Future Trends of Technology In Jewellery Industry
- Traceability and Transparency on gemstone Testing
- Building Supply Chain Resiliency with Digitalisation for Practitioners and Policy Makers
- Knowledge Exchange between Academic and Professional Communities
- Blockchain and Artificial Intelligence Solutions for Enterprise and Professional Communities

A conference paper was published in the following conference proceedings.

W.F. Tang\*, C.H. Li, S.L. Mak. (2023). ‘Enhancing Data Exchange Trust in the Jewellery Industry with Blockchain Technology’. World Conference on Smart Trends in Systems, Security & Sustainability, Lecture Notes in Networks and Systems book series, Springer

## 6.4 Summary of objectives addressed to date

<b>Objectives</b>	<b>Addressed</b> <i>(please tick)</i>	<b>Percentage Achieved</b> <i>(please estimate)</i>
1. To organise research seminars for consumers, scholars, industrial practitioners and professional institutions in order to provide insight and broaden the knowledge on the of blockchain evolution, gemmological science, smart design and visualization, jewellery authenticity, evolving supply chain management for the jewellery industry and the transformation to Industry 4.0.	✓	100%
2. To organise an international symposium as a collaboration platform for sharing ideas and knowledge for of blockchain evolution, gemmological science, smart design and visualization, and jewellery authenticity, evolving supply chain management for the jewellery industry and the transformation to Industry 4.0, and publish the selected papers.	✓	100%

## 6.5 Project progress

<b>Original Implementation Schedule</b>	<b>Revised Implementation Schedule</b> <b>(Date of RGC's Approval)</b>	<b>Updated Progress</b>
First seminar: The latest blockchain technology and platform development	N/A	Completed (30 Jun 2022)
Second seminar: Gemmological science, smart design and visualization, jewellery authenticity technology	N/A	Completed (30 Sep 2022)

Third seminar: Supply chain management and industry initiatives for jewellery industry	N/A	Completed (11 Nov 2022)
Fourth seminar: Machine learning, artificial intelligence and Industry 4.0 of jewellery industry	N/A	Completed (13 Jan 2023)
International Symposium on Blockchain Technology and Digitization for Industrial and Professional Economy	N/A	Completed (3 Mar 2023)

## 6.6 Speaker(s)

<b>Title / Name</b> (Surname in Capital Letters)	<b>Post / Institution</b>	<b>Title / Topic of Presentation / Course</b>	<b>Previous Research Links with Hong Kong Institutions</b> (Nature and Date (Month / Year))
Dr. Lore KIEFERT	Founder, Gemmology Consulting (Germany)	The Impact of Blockchain Technologies on Gemstone Testing	N/A
		Traceability and Transparency on Gemstone Testing	
Professor Kim Hua TAN	Professor, Nottingham University Business School	Case Study on the Enhancement of Transparency and Compliance: Blockchain Adoption to Empower Ugandan Small Holder Hot Pepper Farmers	N/A
		Building Supply Chain Resiliency with Digitalisation for Practitioners and Policy Makers	



Dr. Colin LEE	<p>Founder, Digital Buildrise and Digital Awakens NFT VC.</p> <p>General Partner, Venus Global Opportunities LFP</p> <p>Chairmen, Blockchain Industrial Analysis Association.</p> <p>Founder, Blockchain Industry Analyst Association</p>	A Sharing the Blockchain in Customs and Jewellery Industry	N/A
Dr. Daniel NYFELER	Managing Director of Gübelin Gem Lab	Provenance Proof Blockchain, the industry standard for tracking gemstones from the mine to the final customer	N/A
Dr. Dominic MOK	DBA, MSc, FGA, FGAA, DGA, AGA (Expert) Founder & Laboratory Limited (AGIL) Expert Gemmologist	Brief Review of Advanced Gem Testing Technology in Hong Kong	N/A
Dr. Wafaa AHMED	Assistant Professor in Information Systems Department of Operations Management and Information Systems Nottingham University Business School University of Nottingham	Blockchain Technology Applications for Supply Chain Traceability	N/A
Dr. Harry CHOW	Principal consultant of Vantis Solutions Limited	Application cases sharing of digital twin and metaverse for manufacturing and retailing	N/A

Professor Asim TEWARI	Professor in the Department of Mechanical Engineering, faculty member of the Center for Machine Intelligence and data Science (C-MInDS), The Indian Institute of Technology Bombay, Mumbai	The convergence of Engineering and Machine Learning: A new paradigm in jewellery industry	N/A
Mr. Keith KWOK	Senior Project Manager (IT Dept), Ka Shui International Holdings Limited, HKSAR, China	Industry 4.0 and the impacts of IIoT in the manufacturing industry	N/A
Mr. Danny CHAU	Managing Director, Front Top Jewelry Manufacturing Limited	The Application and Future Trends of Technology in Jewellery Industry	N/A
Dr. Anne O' GRADY	Principal Lecturer, Continuing Professional Education, Nottingham Institute of Education	Knowledge Exchange between Academic and Professional Communities	N/A
Dr. Verity AIKEN	Senior Lecturer in Education, Nottingham Trent University	The role of the Professional Doctorate for Professional Communities	N/A
Mr. Kevin KAM	Chief Technology Officer, Pivotal Technologies Limited	The Application of Blockchain and AI in Wine Trading Industry	N/A

- 6.7 Please provide details of the activities organized, including the theme / objectives of the activities, targeted participants, attendance, analysis of participants, e.g. country of origin, research background, etc., evaluation forms of the activities and a summary of the participants' evaluation. Photos of the activities are preferred.)

A series of four seminars and an international symposium were organized with the main theme of "Digital Revolution Blockchain Technology for facilitating trusted data exchange for Jewellery Industry". The events acted as a platform for the experts to share their experiences and to broaden the knowledge of blockchain technology applied in jewellery industry. There were over 400 participants in the five events. The content shared in the events were great resources to all the participants, including the invited speakers who come from different countries (such as the Switzerland, Germany, United Kingdom, India and Hong Kong). It also benefited other attendees with related academic backgrounds and industrial backgrounds. During the panel discussions at the end of each event, there were noteworthy exchanges of ideas between the experts with different specialties. The following table shows the participants in each event.

Event	Date	Speakers	Number of participants
First seminar: <i>The latest blockchain technology and platform development</i>	30 Jun 2022	<i>Dr Lore KIEFERT</i> <i>Prof Kim Hua TAN</i> <i>Dr Colin LEE Chi-Kin</i>	68
Second seminar: <i>Gemmological science, smart design and visualization, jewellery authenticity technology</i>	30 Sep 2022	<i>Dr Daniel NYFELER</i> <i>Dr Dominic MOK</i>	71
Third seminar: <i>Supply chain management and industry initiatives for jewellery industry</i>	11 Nov 2022	<i>Dr Wafaa AHMED</i> <i>Dr Harry CHOW</i>	70
Fourth seminar: <i>Machine learning, artificial intelligence and Industry 4.0 of jewellery industry</i>	13 Jan 2023	<i>Mr Keith KWOK</i> <i>Professor Asim TEWARI</i>	47
International Symposium on Blockchain Technology and Digitization for Industrial and Professional Economy	3 Mar 2023	<i>Mr. Danny CHAU</i> <i>Dr Lore KIEFERT</i> <i>Prof Kim Hua TAN</i> <i>Dr Anne O' GRADY</i>	178



		<i>Dr Verity AIKEN</i>  <i>Mr. Kevin KAM</i>	
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The events received positive feedback from the participants, which was reflected in the results of the evaluation survey. An evaluation questionnaire consisting of 11 questions was distributed to the participants for them to provide feedback on the events. All of the participants stated that they were satisfied or very satisfied with the activities and the performance of the speakers, as well as the overall evaluation. The participants also found the events were well organized with suitable duration while meeting their expectations. The average score of likeliness to meet the expectations was 4.12 out of 5. Besides, the participants considered the events useful or extremely useful as they agreed the activities helped learning new information. They also reckoned that they would recommend the events to their friends or colleagues as reflected in the average score of 4.14 out of 5 for the likeliness to recommend the events. Overall, all of the participants would like to attend more related events with improvements on longer presentation time and more demonstration on gemstone testing. Some photos from the events and the summary of the responses to the questionnaire are shown below.

First seminar – The Latest Blockchain Technology and Platform Development was held on 30 June 2022 at the Hong Kong Metropolitan University. There were 68 participants joining this event through online meeting platform.

Organizers:  

Seminar on  
**Blockchain Technology for  
Facilitating Trusted Data Exchange for Jewellery Industry**  
(First seminar)

Date: 3:30 – 5:00 pm  
(GMT+8 Hong Kong)  
30 Jun 2022 (Thu)

**Dr Lore Kiefert**  
Technology Consultant  
"The Impact of Blockchain  
Technologies on  
Gemstone Testing"

**Prof. Kim Huan TAN**  
Associate Professor and  
Associate Dean  
"Case Study on the Enhancement  
of Transparency and Compliance  
Blockchain Adoption in Singapore  
Upstream Smallholder and Farmer  
Forestry"

**Dr Colin Lee Chi Kin**  
Associate Professor  
"A Glimpse into Blockchain  
in Customs and  
Jewellery Industry"

**Dr Fanny TANG**  
Associate Professor  
"Panel Discussion"

Registration Link:  
<https://forms.gle/FKGGYVLMJm3G8N4q8>

Acknowledgment:  
This seminar is generously supported by a grant from the  
Research Grants Council of the Hong Kong Special Administrative Region,  
China (GRC(G)-18/00001).

### Speakers

Organizers:  

Seminar on  
**Blockchain Technology for  
Facilitating Trusted Data Exchange for Jewellery Industry**  
(First seminar)

**Speakers' Biography**

**Prof. Kim Huan TAN**  
Associate Professor  
Associate Dean  
Prof. Kim Huan Tan is a Professor in Operations and Information Management, and a  
senior research fellow at the Hong Kong Metropolitan University. He has over 20 years of  
experience in the field of operations and information management, and has published  
over 100 research papers in international journals and conferences. He is also a  
senior research fellow at the Hong Kong Metropolitan University, and has been  
awarded several research grants from the Hong Kong Research Grants Council.  
He is currently the Associate Dean of the Faculty of Business and Economics,  
and is also the Associate Dean of the Centre for Operations and Information  
Management.

**Dr Lore Kiefert**  
Technology Consultant  
Dr Lore Kiefert is a technology consultant with over 10 years of experience in the  
field of blockchain technology. She has worked with several leading companies  
in the field of blockchain technology, and has been instrumental in the  
development and implementation of several blockchain-based solutions. She  
has also been a speaker at several international conferences on blockchain  
technology, and has published several research papers on the topic.

**Dr Colin Lee Chi Kin**  
Associate Professor  
Dr Colin Lee Chi Kin is an Associate Professor in the Department of  
Computer Science and Information Systems, Hong Kong Metropolitan University.  
He has over 10 years of experience in the field of computer science and  
information systems, and has published over 50 research papers in international  
journals and conferences. He is also a senior research fellow at the Hong Kong  
Metropolitan University, and has been awarded several research grants from the  
Hong Kong Research Grants Council.

**Dr Fanny TANG**  
Associate Professor  
Dr Fanny Tang is an Associate Professor in the Department of Computer  
Science and Information Systems, Hong Kong Metropolitan University. She has  
over 10 years of experience in the field of computer science and information  
systems, and has published over 50 research papers in international journals and  
conferences. She is also a senior research fellow at the Hong Kong Metropolitan  
University, and has been awarded several research grants from the Hong Kong  
Research Grants Council.

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Research Grants Council of the Hong Kong Special Administrative Region,  
China (GRC(G)-18/00001).

### Speakers' biography

**DR. LORE KIEFERT**  
GEMMOLOGY CONSULTING

The Impact of Blockchain Technology  
on Gemstone Testing

Dr. Lore Kiefert

30 JUN 2022

Presentation by Dr. Lore Kiefert

**DR. LORE KIEFERT**  
GEMMOLOGY CONSULTING

Life of an emerald

Mining → Sorting → Cutting → Wholesaler → Jeweller

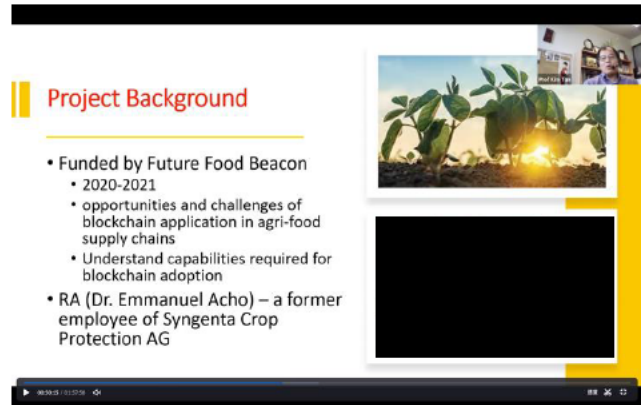
Oil/resin → Report → Oil/resin

30 JUN 2022

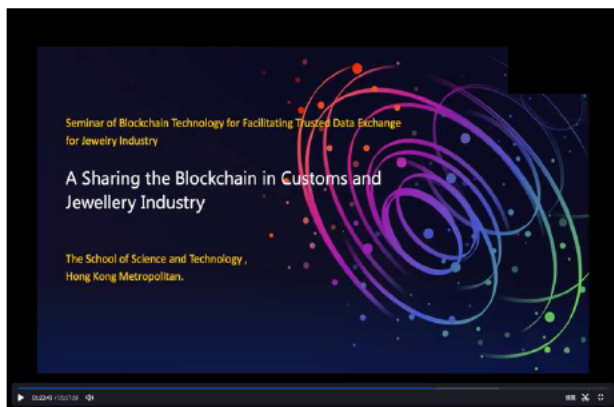
Topic: The Impact of Blockchain Technologies on Gemstone Testing



Presentation by Professor Kim Hua TAN

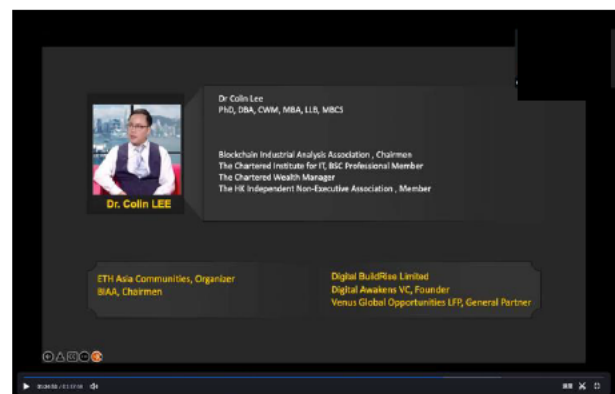


Topic: Case Study on the Enhancement of Transparency and Compliance: Blockchain Adoption to Empower Ugandan Small Holder Hot Pepper Farmers

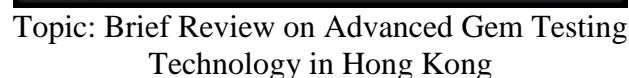
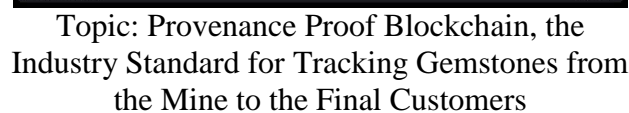
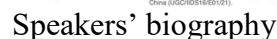
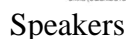


Presentation by Dr. Collin Lee

Topic: A Sharing the Blockchain in Customs and Jewellery Industry







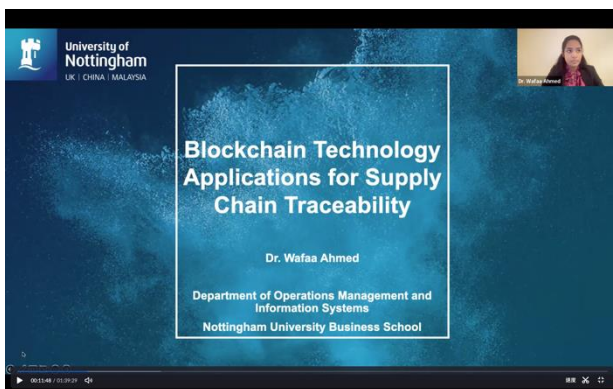
Third seminar – Supply chain management and industry initiatives for jewellery industry was held on 11 November 2022 at the Hong Kong Metropolitan University. There were 70 participants joining this event through online meeting platform.



Speakers



Speakers' biography



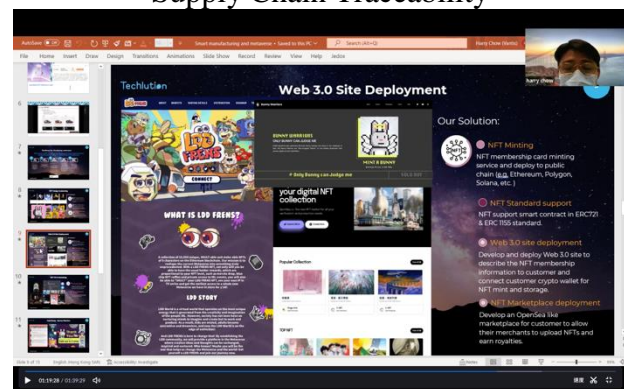
Presentation by Dr. Wafaa Ahmed



Topic: Blockchain Technology Applications for Supply Chain Traceability



Presentation by Dr. Henry Chow



Topic: Application Cases Sharing on Digital Twin and Metaverse for Manufacturing and Retailing



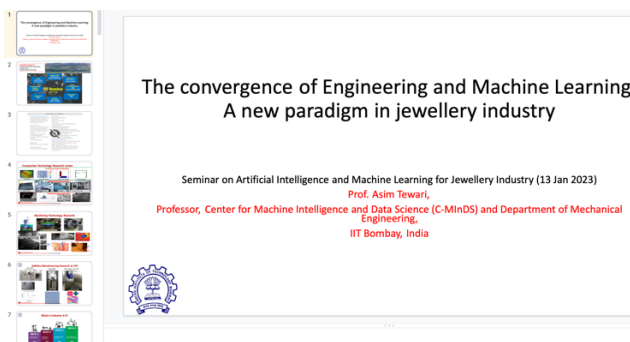
Fourth seminar – Machine learning, artificial intelligence and Industry 4.0 of jewellery industry was held on 13 January 2023 at the Hong Kong Metropolitan University. There were 47 participants joining this event through online meeting platform.



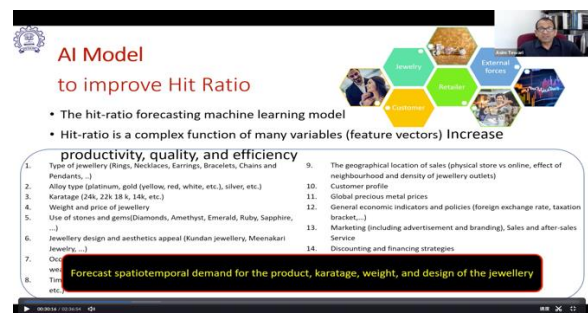
## Speakers



## Speakers' biography



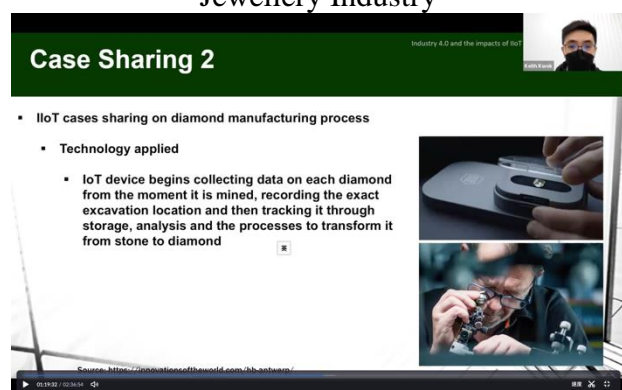
Presentation by Professor Asim Tewari



## Topic: The Convergence of Engineering and Machine Learning: A New Paradigm in Jewellery Industry



Presentation by Mr. Keith Kwok



Topic: Industry 4.0 and the Impacts of IIoT in the Manufacturing Industry

International Symposium – Blockchain Technology and Digitization for Industrial and Professional Economy was held on 3 March 2023 at the Hong Kong Metropolitan University. There were 178 participants joining this event through face-to-face and online meeting platform



The invited speakers of the symposium



The conference rundown



Presentation by Mr. Danny Chau



Topic: The Application and Future Trends of Technology in Jewellery Industry



Presentation by Dr. Lore Kiefert



Topic: Traceability and Transparency on Gemstone Testing





Presentation by Professor Kim Hua Tan



Topic: Building Supply Chain Resiliency with Digitalization: Recommendations for Practitioners and Policy Makers



Presentation by Dr. Anne O' Grady



Topic: Knowledge Exchange between Academic and Professional Communities



Presentation by Dr Verity Aiken



Topic: The Role of Professional Doctorate for Professional Communities





Presentation by Mr. Kevin Kam



Topic: The Application of Blockchain and AI in Wine Trading Industry



Group photos with the speakers



Panel Discussion

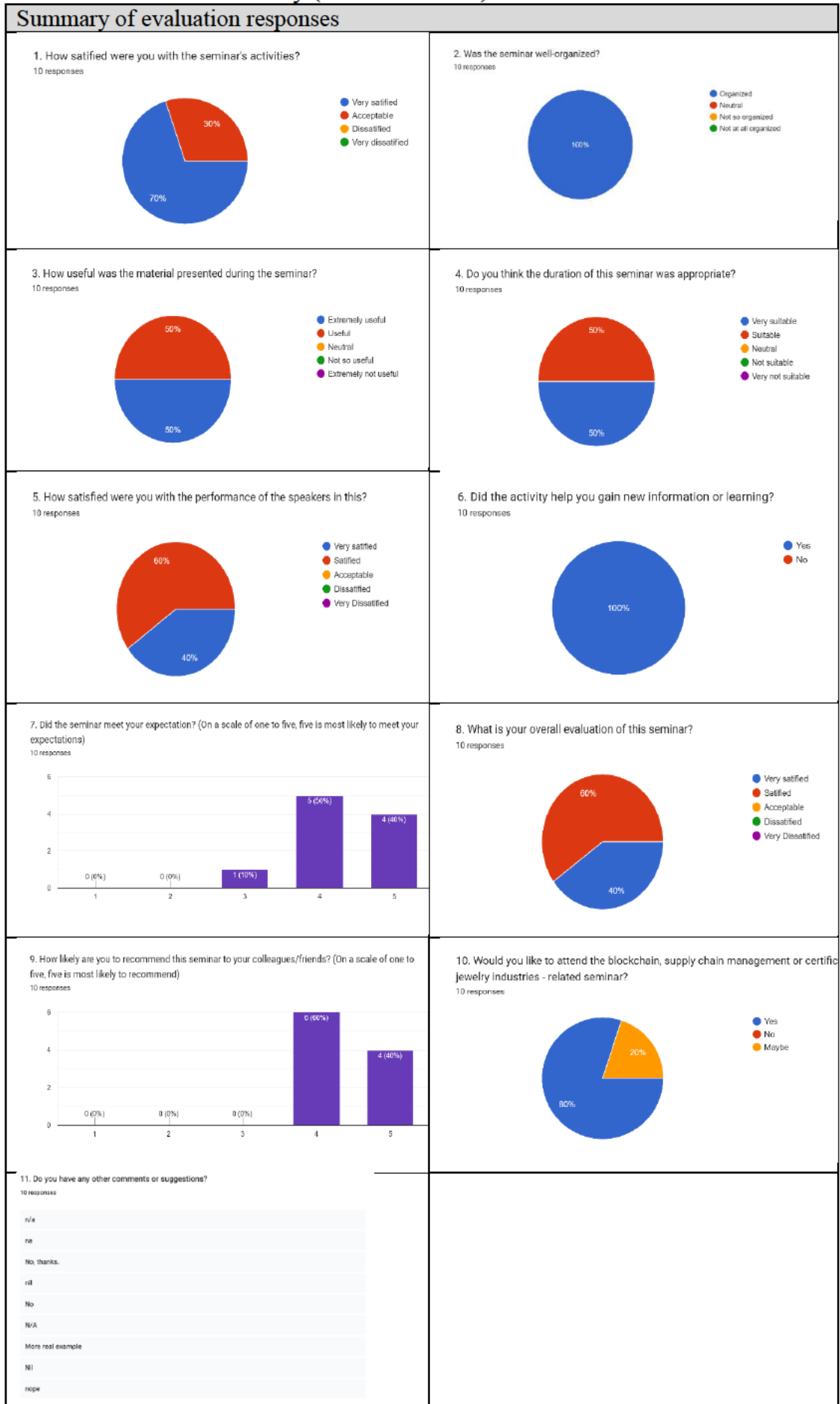


Participants of the symposium



The participants were impressed by the speakers' sharing

## One of the evaluation summary (second seminar)



## 7. Research-Related Outcome

### 7.1 Potential for development into research proposal and the proposed course of action (*Maximum half a page*)

(submitted research proposal or proposed action)

- The advanced gemstone testing techniques learnt from the speakers were included in the course – TCS332F Material Characterization and Testing.
- The project team has also published a conference paper in 2023.  
W.F. Tang\*, C.H. Li, S.L. Mak. (2023). ‘Enhancing Data Exchange Trust in the Jewellery Industry with Blockchain Technology’. World Conference on Smart Trends in Systems, Security & Sustainability, Lecture Notes in Networks and Systems book series, Springer

### 7.2 Research collaboration achieved

(*Please give details on the achievement and its relevant impact*)

The events attracted participants of different background including the experts from academia and the professional practitioners in the industry. The events have also drawn attention and encouragement from the supporting organizations including:

- The Hong Kong Institution of Engineers (HKIE) - Control, Automation & Instrumentation Division
- The Hong Kong Institution of Engineers - Manufacturing, Industrial & Systems (MIS) Division (HKIE-MIS)
- The Institution of Engineering and Technology (IET) Hong Kong
- The Institute of Measurement and Control (InstMC) (Hong Kong Branch)
- The Institution of Engineering and Technology
- The Hong Kong Institution of Measurement and Automation
- Measurement Control Technology and Equipment Application Promotion Association of Guangdong Province
- HKIE Control, Automation & Instrumentation Division;
- HKIE Manufacturing, Industrial & Systems Division; and
- Institute of Measurement and Control
- Asia Pacific Gemmologist Society;
- Asian Gemmological Institute & Laboratory Limited;

### 7.3 Any new development and/or challenging research topic(s) has / have been identified and any new initiative(s) for future research has / have been inspired.

(new initiatives for future research)

There were several speakers share the importance of digital twin technology in gemstone industry. The project team was inspired by the digital twin technology which can reduce waste, carbon emissions, and makes things more energy efficient in construction industry. Digital twin technology offers a three-dimensional virtual clone of a data centre, allowing for the simulation of its functioning under various settings or conditions. It can be used to verify that the installed equipment meets the necessary storage capacity and that cooling systems operate with optimal efficiency. Engineers may use a digital twin, together with real-time data on power usage and temperature, to compare and analyse the anticipated and observed performance of a data centre. This may not only aid in decreasing energy usage, but it can also forecast the consequences of any suggested modifications on power distribution and space utilisation. It assists facility managers in extracting data from

separate information repositories to get a comprehensive view, which includes the tangible effects on performance resulting from integrated alterations. Currently, our project team is conducting research works on energy efficiency and residential plumbing systems for building property management. The project team will conduct a thorough investigation to determine the viability of using this innovative technology in order to improve energy efficiency and decrease carbon emissions in the property management and construction industry.

## 8. The Layman's Summary

*(Describe in layman's language the nature, significance and value of the research activities, in no more than 200 words)*

The project aimed to establish and enhance collaboration among institutions in Hong Kong regarding the development of blockchain technology for jewellery industry in order to improve the competitiveness of the jewellery industry in Hong Kong. The collaborating institutions, Hong Kong Metropolitan University and The Hong Kong Baptist University, invited experts to share their experiences, innovative techniques, and perspectives on the potential of blockchain and digital twin technology for the jewellery industry.

Four seminars and an international symposium were organised, focusing on the topic of "Digital Revolution Blockchain Technology for facilitating trusted data exchange for the Jewellery Industry." The events served as a forum for specialists to exchange their experiences and expand their understanding of the use of blockchain technology in the jewellery industry. The events included speakers from a diverse variety of backgrounds, including local and international speakers from Switzerland, Germany, the United Kingdom, India, and Hong Kong. In addition to academic specialists, professionals from the industry were also invited to explain the current practices of blockchain technology and supply chain management. The events presented novel concepts backed by empirical evidence, which the attendees found enlightening and valuable for their future work.

**Part C: Research Output****9. Recognized Conference(s) Paper(s) Related To This Project Was / Were Delivered (As Applicable)***(Please attach a copy of each conference abstract)*

<b>Month / Year / Place</b>	<b>Title</b>	<b>Conference Name</b>	<b>Submitted to RGC</b> <i>(indicate the year ending of the relevant progress report)</i>	<b>Attached to this Report</b> <i>(Yes or No)</i>	<b>Acknowledged the Support of RGC</b> <i>(Yes or No)</i>
July 2023	Enhancing Data Exchange Trust in the Jewellery Industry with Blockchain Technology	World Conference on Smart Trends in Systems, Security & Sustainability	No	Yes [Attachment]	Yes

**10. Research Personnel Trained (As Applicable)**

<b>Name</b>	<b>Capacity</b>

**11. Other Impact (As Applicable)***(e.g. prizes, collaboration with other research institutions, technology transfer, etc.)*

The project team has successfully collaborated with The Hang Seng University of Hong Kong to submit a new IIDS proposal (2024/2025) proposing the use of digital twins in structures and construction, which introduces a novel concept. The project is titled "Navigating Applied Artificial Intelligence (AI) in the Digital Era: How Smart Buildings Become the Key to Sustainability."

**12. Statistics on Research Outputs**

	<b>Peer-reviewed Journal Publications</b>	<b>Conference Papers</b>	<b>Scholarly Books, Monographs and Chapters</b>	<b>Patents Awarded</b>	<b>Other Research Outputs (please specify)</b>	
<b>No. of outputs arising directly from this project</b>	N/A	1	N/A	N/A	Type	No.

**13. Public Access Of Completion Report***(Please specify the information, if any, that cannot be provided for public access and give the reasons.)*

<b>Information that Cannot Be Provided for Public Access</b>	<b>Reasons</b>
N/A	N/A