

RGC Ref. No.: UGC/IIDS15/B01/20
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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)

<p><b><u>Submission Deadlines:</u></b></p> <ol style="list-style-type: none"> <li>1. The unspent balance, if applicable, and auditor's report: within <b><u>six</u></b> months of the approved project completion date.</li> <li>2. Completion report: within <b><u>12</u></b> months of the approved project completion date.</li> </ol>
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**Part A: The Project and Investigator(s)**

**1. Project Title**

Data analytics for quality reporting and effective auditing

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

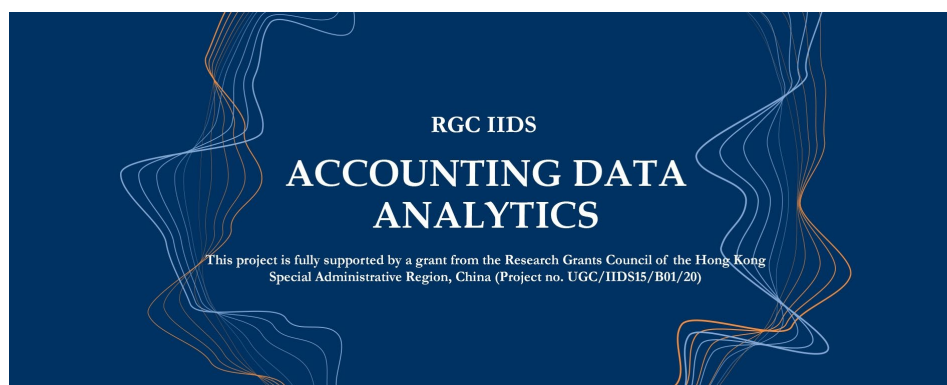
Research Team	Name / Post	Unit / Department / Institution
Principal Investigator	Dr. LEE, Hua / Associate Professor	Accounting/ Hong Kong Shue Yan University
Co-Investigator	Dr. CHEN, Chao-Jung / Professor	Accounting/ National Pingtung University
Co-Investigator	Dr. CHEN, WanYu / Assistant Professor	Accounting/ Hong Kong Shue Yan University
Co-Investigator	Dr. XIE, Yuying / Assistant Professor	Accounting/ Hong Kong Shue Yan University

**3. Project Duration**

	Original	Revised	Date of RGC / Institution Approval (must be quoted)
Project Start Date	1 January 2021	1 August 2021	9 November 2020
Project Completion Date	31 December 2021	31 July 2022	9 November 2020
Duration (in month)	12	12	9 November 2020

Deadline for Submission of Completion Report	31 December 2022	31 July 2023	9 November 2020
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4.4 Please attach photo(s) of acknowledgement of RGC-funded activities.



**ACCOUNTING DATA ANALYTICS**

DECEMBER 2021 / APRIL 2022

**SPEAKERS**

<b>Dr. Miklos A. Vasarhelyi</b> Rutgers Business School The State University of New Jersey	<b>Dr. Sunita Goel</b> School of Business Siena College	<b>Dr. Roman Chychyla</b> Miami Herbert Business School University of Miami	<b>Dr. Hsihui Chang</b> LeBow School of Business Dartmouth University
<b>Dr. Michael Alles</b> Rutgers Business School The State University of New Jersey	<b>Dr. Joseph Zhang</b> Crews School of Accountancy The University of Memphis	<b>Dr. Tawei Wang</b> School of Accountancy & MIS DePaul University	<b>Dr. Richard Crowley</b> School of Accountancy Singapore Management University

This project is fully supported by a grant from the Research Grants Council of the Hong Kong Special Administrative Region, China (Project no. UGC/IIDS15/B01/20)

FREE REGISTRATION

## **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 Shue Yan University	100	Being responsible for undertaking the project
<b>Collaborating Institution(s) (If any) #</b>	N/A		
<b>Total:</b>		<b>100</b>	

# 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 explore the relation between big data analytics and reporting quality of accounting
2. To investigate the relation between data analytics and effective audits of financial reports
3. To examine the relation between data analytics and fraud detection

#### **6.2 Revised objectives**

Date of approval from the RGC: N/A

Reasons for the change:

- 1.
- 2.
3. ....

#### **6.3 Realisation of the objectives**

Eight workshops/seminars were completed as planned. Each of all three project objectives was 100% achieved. Speakers, moderators, researchers, and practitioners, and students attended the workshops and gained knowledge in the topics presented.

The first objective was to explore the relation between big data analytics and reporting quality of accounting. Dr. Miklos Vasarhelyi presented how big data analytics can

improve the relevance of financial accounting. Dr. Joseph Zhang presented how automation technology can help communication through useful financial reports. Dr. Hsihui Chang presented the application of data analytics and transformative technology for managerial decision-making. These three workshops provided participants the knowledge of how data analytics and the new applications such as data mining, predictive analytics and machine learning improve accounting information quality for the decision-making of investors and other users.

The second objective was to investigate the relation between data analytics and effective audits of financial reports. Dr. Roman Chychyla explained the relation between data analytics for audit planning and audit tests. Dr. Michael Alles presented the relation between audit data analytics and continuous data-level auditing. Dr. Tawei Wang explained the application of audit data analytics in modern audit engagements. Participants have learned how data analytics techniques improve audit engagements, audit procedures, and audit evidence examination for financial statement audits.

The third objective was to examine the relation between data analytics and fraud detection. Dr. Sunita Goel explained the impact of big data analytics on fraud detection and prediction. Dr. Richard Crowley presented new applications of data analytics, and fraud detection and prediction. These workshops explained how different techniques in data analytics contribute to the detection and prediction of financial statement fraud and employee fraud.

#### 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 explore the relation between big data analytics and reporting quality of accounting	√	100%
2. To investigate the relation between data analytics and effective audits of financial reports	√	100%
3. To examine the relation between data analytics and fraud detection	√	100%

#### 6.5 Project progress

<b>Original Implementation Schedule</b>	<b>Revised Implementation Schedule</b> <b>(Date of RGC's Approval: 30 August 2021)</b>	<b>Updated Progress</b>
Seminar 1: Big data analytics and relevance of financial	Seminar 1: Big data analytics and relevance of financial accounting	Completed

accounting 29 April, 2021	December 2021	
Seminar 2: Automation technology and communicating with investors through useful financial reports 29 April, 2021	Seminar 2: Big data analytics and fraud detection and prediction December 2021	Completed
Seminar 3: Data analytics and transformative technology for managerial decision-making 30 April, 2021	Seminar 3: Data analytics for audit planning and audit tests December 2021	Completed
Seminar 4: Data analytics for audit planning and audit tests 30 April, 2021	Seminar 4: Data analytics and transformative technology for managerial decision-making December 2021	Completed
Seminar 5: Audit data analytics and continuous data- level auditing 9 December, 2021	Seminar 5: Audit data analytics and continuous data- level auditing April 2022	Completed
Seminar 6: Audit data analytics and modern audit engagements 9 December, 2021	Seminar 6: Automation technology and communicating with investors through useful financial reports April 2022	Completed
Seminar 7: Big data analytics and fraud detection and prediction 10 December, 2021	Seminar 7: Audit data analytics and modern audit engagements April 2022	Completed
Seminar 8: New applications of data analytics in the detection and prediction for financial statement and/or employee fraud 10 December, 2021	Seminar 8: New applications of data analytics in the detection and prediction for financial statement and/or employee fraud April 2022	Completed

## 6.6 Speaker(s)

Title / Surname (in capital letters) / Other Names	Post / Institution	Title / Topic of Presentation / Course	Previous Research Links with Hong Kong Institutions (Nature and Date (Month/Year))
Dr. VASARHELYI, Miklos A.	KPMG Distinguished Professor of Accounting Information Systems / Rutgers, the State University of New Jersey	Big data analytics and relevance of financial accounting	NA
Dr. GOEL, Sunita	Associate Professor, Department of Accounting and Business Law, Siena College	Big data analytics and fraud detection and prediction	NA

Dr. ROMAN, Chychyla	Department of Accounting Miami Herbert Business School, University of Miami	Data analytics for audit planning and audit tests	NA
Dr. CHANG, Hsihui	Distinguished Professor of Accounting / Drexel University	Data analytics and transformative technology for managerial decision-making	Visiting professor, City University of Hong Kong (Jan./2018)
Dr. ALLES, Michael	Professor / Rutgers, the State University of New Jersey	Audit data analytics and continuous data-level auditing	NA
Dr. ZHANG, Joseph	Associate Professor / The University of Memphis	Automation technology and communicating with investors through useful financial reports	NA
Dr. WANG, Tawei	Associate Professor and Driehaus Fellow, School of Accountancy & MIS, DePaul University	Audit data analytics and modern audit engagements	NA
Dr. CROWLEY, Richard	Assistant Professor, School of Accountancy, Singapore Management University	New applications of data analytics in the detection and prediction for financial statement and/or employee fraud	NA

- 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.)

The themes and objectives of the workshops are as follows.

Theme	Objective of activity
1 Big data analytics in financial accounting	Big data analytics and relevance of financial accounting (Objective 1)
2 Automation technology for communication through financial reports	Automation technology and communicating with investors through useful financial reports (Objective 1)
3 Data analytics in managerial decision-making	Data analytics and transformative technology for managerial decision-making (Objective 1)

4 Data analytics for audit procedure	Data analytics for audit planning and audit tests (Objective 2)
5 Data analytics in continuous data-level auditing	Audit data analytics and continuous data- level auditing (Objective 2)
6 Data analytics in audit engagements	Audit data analytics and modern audit engagements (Objective 2)
7 Data analytics and fraud detection	Big data analytics and fraud detection and prediction (Objective 3)
8 New applications of data analytics in fraud prediction	New applications of data analytics in the detection and prediction for financial statement and/or employee fraud (Objective 3)


### Summary of participants

Targeted and actual participants include practitioners in the accounting and auditing profession, educators, researchers, students, etc. The participants' expertise is accounting, auditing, and/or information management. Participants' country of origin includes Hong Kong, Taiwan, Singapore, and United States of America. One the first day for two workshops, around 80 participants attended the two virtual workshops. On the second day for the next two workshops, around 95 participants attended the two virtual workshops. On the third day for another two workshops, around 102 participants attended the two virtual workshops. On the fourth day for the last two workshops, around 73 participants attended the two virtual workshops.

### Sample of evaluation forms

To evaluate the effectiveness of the workshops, the following evaluation form was designed and used in the evaluation.

Question	Strongly disagree	Disagree	Agree	Strongly agree
	1	2	3	4
1. The workshops are relevant, valuable, and useful				
2. The speakers are knowledgeable and well-prepared				
3. The presentations are well-structured and informative				
4. The arrangements for the duration and facilities are adequate				
5. The overall quality of workshop materials (e.g. posters) is impressive				
6. Speakers welcome and answer questions properly				
7. I have a better understanding of accounting and audit data analytics after the workshop				
8. Overall, I am satisfied with the workshops				



香港樹仁大學  
 HONG KONG SHUE YAN UNIVERSITY

### RGC IIDS survey

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**Subject information**

I am \*

☐ (1) HKSYU student  
☐ (2) HKSYU academic staff

For each question, please indicate your degree of satisfaction. \*

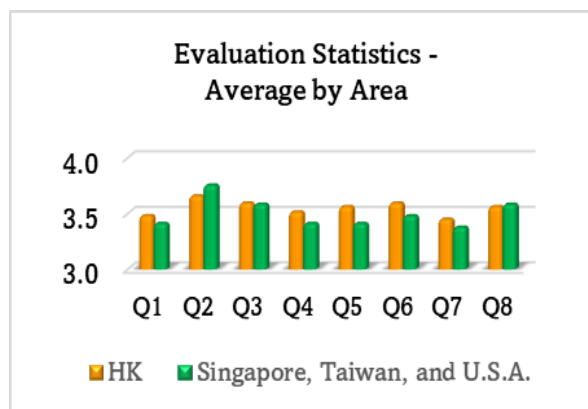
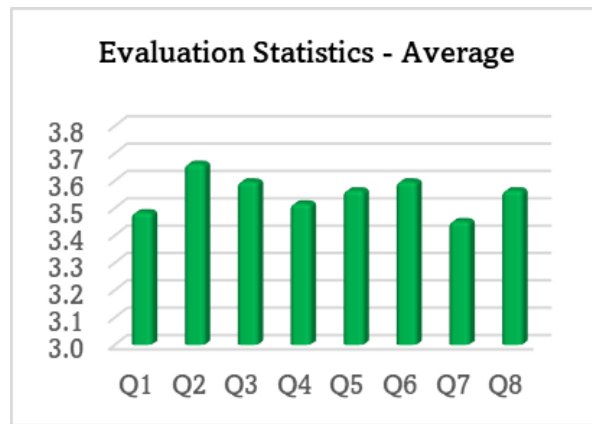
	Very high	High	Low	Very low
The workshops are relevant, valuable, and useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The speakers are knowledgeable and well-prepared	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The presentations are well-structured and informative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The arrangements for the duration and facilities are adequate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The overall quality of workshop materials (e.g. posters) is impressive and high	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Speakers welcome and answer questions properly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a better understanding of accounting and audit data analytics after the workshop	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall, I am satisfied with the workshops	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Summary of participants' evaluation

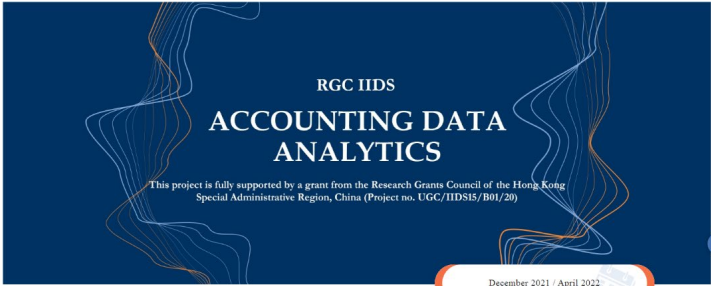
The results for the evaluation by participants are summarized below. The results showed that the averages of all questions are around 3.6 out of 4, suggesting that all participants generally appreciated the offerings of the workshops. The results suggest that the workshops are relevant and useful for their understanding of accounting and auditing analytics. The quality of workshop materials (e.g., posters) was impressive. The arrangements for the duration and facilities are adequate. Speakers were knowledgeable and well-prepared for their presentations, and welcoming and answering questions appropriately. The presentations were well-structured and informative. Overall, participants were satisfied with the workshops and gained a better understanding of accounting and audit data analytics after the workshops.

Type	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Hong Kong	3.5	3.7	3.6	3.5	3.6	3.6	3.5	3.6
Singapore, Taiwan, and U.S.A.	3.4	3.8	3.6	3.4	3.4	3.5	3.4	3.6
All participants	3.5	3.7	3.6	3.5	3.5	3.6	3.4	3.6





Photos of the events

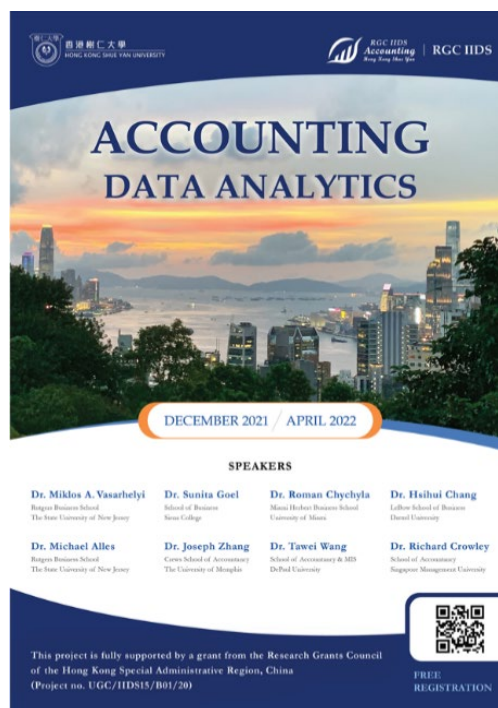


**RGC IIDS**  
**ACCOUNTING DATA ANALYTICS**

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December 2021 / April 2022

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## 7. Research-Related Outcome

### 7.1 Potential for development into research proposal and the proposed course of action

Based on the outcome of this project, PI and three co-investigators submitted a research project (UGC/IIDS15/B01/22) to apply for a research grant from RGC. The emergence of AI and big data has an overwhelming impact on the accounting profession. Therefore, building on this project, the proposal extended to the context of digital economy. It explores the applications of digital and transformation technologies in the accounting profession.

### 7.2 Research collaboration achieved (Please give details on the achievement and its relevant impact)

All investigators from different universities in Hong Kong and Taiwan have cooperated to complete all workshops with participants from Hong Kong, Taiwan, Singapore and the United States. Researchers were impressed with the research grant from RGC of Hong Kong under the IIDS scheme. Such an international collaboration between PI and Co-Is provides a channel for exchanging views about the topics involved in this project and enhances the interaction among international scholars.

### 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.

All investigators submitted a research project to apply for a research grant from RGC (see 7.1). Additionally, having built on knowledge gained from this project, all investigators conducted a comprehensive review of studies in audit data analytics and extended to empirical research on audit quality. The review paper was accepted for publication by a peer-reviewed academic journal. This journal publication is expected to prolong and magnify the impact of this project funded by RGC under the IIDS.

**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)*

Data analytics has been one of the most significant fields in the ever-changing business world. The rapid advancement of information technology and electronic devices promotes data accumulation in the changed business models, strategies, and operations, and enhances the value of business information in today's data-driven business environment. Facing this revolution, the audit profession has developed new techniques and standards in the auditing of financial statements and fraud detection. This project explores the impact of data science on the quality of accounting information and the effectiveness of financial statement audits and fraud detection. Major issues include how data analytics can improve the usefulness of accounting information for investment and management decision-making, how data analytics enhance audit procedures and audit evidence examination for financial statement audits, and how data analytics can help auditors to detect and predict fraud and assess the risk of fraud. The results will provide practical implications and contribute to both accounting education and research as well as regulatory authorities.

**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 (indicate the year ending of the relevant progress report)</b>	<b>Attached to this Report (Yes or No)</b>	<b>Acknowledged the Support of RGC (Yes or No)</b>
N/A	N/A	N/A	N/A	N/A	N/A

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

<b>Name</b>	<b>Capacity</b>
N/A	N/A

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

Collaboration with other research institution (National Pingtung University)

**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>	1 C.-J. Chen, W. Chen, Hua Lee, and Y. Xie, 2023, Audit data analytics and audit quality: new insights.	N/A	N/A	N/A	Type	No.
					N/A	N/A

	Journal of Accounting, Finance and Management Strategy (accepted) [Appendix]					
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### 13. Public Access Of Completion Report

*(Please specify the information, if any, that cannot be provided for public access and give the reasons.)*

Information that Cannot Be Provided for Public Access	Reasons
Appendix for the Abstract of the forthcoming publication	The article is accepted for publication in 2023, but it has yet to be published in 2024. Thus, the abstract provided in the Appendix is not to be publicized before the paper is published.