Research Program and Plan

My research focuses on digital transformation, particularly in the design, deployment, and evaluation of technological innovations. It involves enhancing entities through substantial changes by integrating information, computing, communication, and connectivity technologies. I concentrate on two key streams of research work: digital commerce (providing digital services) and digital organization (ensuring operational efficiency). This approach provides insights into the implications of digital advancements within organizations and their interactions.

[1] Digital Commerce

Transformative roles of Information Systems (IS) in enhancing online consumer decision-making and commercial communications

The first significant research stream is digital commerce. In this dynamic landscape, I seek to delve into the essential function of IS in shaping consumer decision-making processes and enhancing the effectiveness of commercial communications. In practical terms, this inquiry will involve developing and testing theories that explore how innovative technologies can be strategically designed and executed to support individual decision-making effectively. For example, one of my earliest works, which is based on my doctoral dissertation titled "Assessing Screening and Evaluation Decision Support Systems: A Resource-Matching Approach" and published in Information Systems Research 2010, examines how online shopping decision aids with screening and evaluation support functionalities could help consumers manage varying product attribute-load conditions. Abstracting and simulating the decision aids in a controlled environment, with the system environment being programmed by me, I conducted a series of laboratory experiments. The study finds that decision aids that match the cognitive resources demanded by the task environment enhance decision performance. In contrast, those that exceed or fall short of these demands detract from performance. This research contributes to resource-matching theory by demonstrating the interaction between decision aid features and attribute load on decision performance.

A subsequent series of works, conducted in collaboration with my PhD students, focuses on developing simulated online environments for theory testing through experimentation, aiming to enhance our understanding of how contextual and content-related factors interact. For instance, in the study titled "Sequentiality of Product Review Information Provision: An Information Foraging Perspective," published in *MIS Quarterly* (2017), we explored how the design of decision aids can optimize the timing of information release to support decision-making. Our examination showed that a well-structured product review sequence can alleviate cognitive overload concerns, improving decision-making. We provide empirical evidence that technological design facilitates this process. Using mixed methods, our findings enhance information foraging theory by highlighting how technology can help users engage in effective information-seeking behaviors. Additionally, related works in this domain have contributed to the extension of theories such as construal level (*Journal of the Association for Information Systems* 2018) and information foraging (*MIS Quarterly* 2017), as well as the proposition of a mid-range theoretical framework concerning review-product congruity *(Journal of Management Information Systems* 2013).

In addition to mentoring my PhD students, I have collaborated with colleagues and guided their PhD students through various research partnerships. For instance, I conducted field experiments in China and Switzerland to evaluate their merchandise with actual consumers in collaboration with local retailers. Our research theorized and empirically validated how personal communication technologies (PCTs), such as email and SMS, affect consumer responses to commercial messages across different cultural contexts. The findings, published in *Information Systems Research* (2014), reveal that SMS is more effective in high-context cultures like China, while email performs better in low-context cultures like Switzerland. This research aids in selecting the most suitable PCTs for commercial communications. It contributes to the theoretical frameworks of apparatgeist and social construction theories by exploring the interplay of technology and cultural environments. In another collaborative project, I focused on designing a

smartphone application that addresses the tension between personalization and privacy in the exchange of information between consumers and merchants. I developed the experiment and led the theorization of technological solutions. This personalized, privacy-safe application keeps user information stored locally on smartphones while delivering tailored product messages. This research contributes to the uses and gratification theory and information boundary theory by examining the impact of privacy on personalization and proposing an IT solution to mitigate the personalization-privacy paradox. It was published in *MIS Quarterly* (2013), received the *INFORMS ISS Design Science Award for Outstanding Design Science Project* in 2013, and has garnered over 620 citations to date.
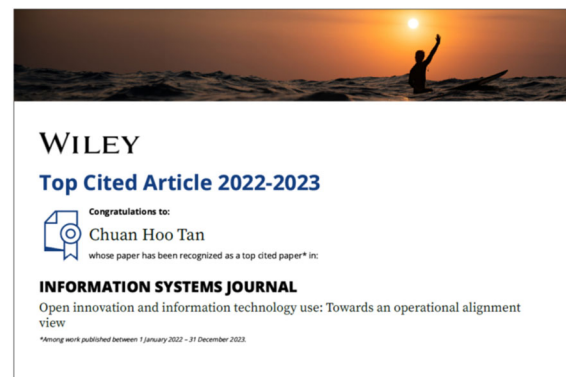
[2] Digital Organization
Innovating IS for Enhanced Organizational Performance

This research stream offers a comprehensive understanding of how IS can be designed and deployed to benefit an organization's internal and external operations.

Focusing on the internal dimension, as organizations digitize and digitalize their business processes to eliminate departmental barriers, enterprise systems (ES) emerge as integral tools that embed organizational policies and rules, guide operations, and lead to integrating business processes with the system. In a series of related empirical studies investigating the effective deployment of ES, I examine how leadership styles, support structures, and system characteristics influence both routine and innovative use of ES, ultimately affecting job performance and satisfaction (forthcoming in *Information Systems Research* 2025). Additionally, I explore how organizational levers, such as autonomous job design and socialization tactics, can foster intrinsic motivation to explore ES features (*Journal of MIS* 2013). Moreover, I analyze the impact of job demands and resources, such as leader-member exchange and support structures, on user competence with ES (*Information Systems Research* 2021). The findings underscore the critical importance of cultivating a supportive work environment to enhance user competence and maximize the value derived from ES.

Focusing on the external dimension, I question how resources outside the boundary of an organization can be acquired through the IS that connects an organization to external entities. Related works have unveiled the dual role of IS in resource acquisition and operation, demonstrating how digital-enabled resource orchestration can enhance innovation performance in dynamic and stable business environments (*Information & Management* 2022, *Information Systems Journal* 2022), rally the code developers and observers on open source community platform to promote knowledge sharing and innovation (*MIS Quarterly* 2019), and manage such collaborations to

enhance knowledge sharing (*Long Range Planning* 2011). The paper published in *Information Systems Journal* 2022 received the top-cited article 2022-2023 recognition.

Integrating the internal and external dimensional view of the digital organization, I also conducted a series of studies that sought to address critical challenges and innovative solutions in healthcare, particularly in response to Singapore's aging population and rising healthcare demands. It transpires and integrates internal operations with external ones. My engagement with this sector began with a journal paper exploring the dynamics of direct and indirect IS use in public hospitals (Information Systems Research, 2017). This study distinguished between these behaviors, proposing a theoretical framework based on social power that enhances our understanding of IS usage dynamics in healthcare. It won the Best Paper Award from AIS SIGHealth in 2018. Recently, I examined the implementation of healthcare IS in public hospitals, focusing on interactions with patients and regulators. Grounded in social transformation theories, this qualitative analysis from China connected healthcare IS affordances to technological interventions and their societal

impacts. The paper, published in MIS Quarterly (2022), received the Information Management Research Award (2023) and was highlighted by Prof. Andrew Burton-Jones at a regional conference (i.e., CSWIM) in 2023. In 2024, Prof. Suprateek Sarker, the Editor-in-Chief of the Information Systems Research journal, invited me to co-author an editorial article on future healthcare IS research with a few other leading IS researchers in healthcare IS. The editorial classifies the field into six themes and identifies four emerging research clusters. It emphasizes ICTs in health crises and AI-enhanced treatments while proposing three future research opportunities. This editorial was published in the March 2025 issue.

<u>Work-in-progress/On Submission</u>

While specific instantiations of IS have evolved and changed due to technological advancements, I strive to remain focused on two critical aspects of digital transformation: digital commerce (i.e., the provision of digital services) and digital organization (i.e., ensuring operational efficiency and performance). I aim to provide deeper insights into the strategic alignment of IS and innovation in various organizational contexts, which I elaborate on with ongoing works and papers under review.

[1] Digital Commerce

I am eager to expand my research on the transformative role of IS in digital commerce, focusing on artificial intelligence (AI). In one of my recent studies, I examined how AI changes stakeholder interactions and information sharing. It explores strategies to enhance consumer engagement in sharing digital coupons by addressing concerns about perceived financial motivation. The research introduces an algorithm-split reward allocation design, which promotes coupon-sharing behaviors by friends and non-friends more effectively than traditional equal-split methods. Through a three-stage approach—field experiment, focus groups, and factorial survey—findings show how this design alleviates metaperception concerns by adding enjoyment and shifting embarrassment onto the algorithm, revealing different motivational mechanisms based on social ties.

- "Corroborating Algorithm-Split Reward Allocation Design to Promote Digital Coupon Sharing: A Metaperception Lens" with Yicheng Zhang and Phang, C. W., *work-in-progress*.

Additionally, alongside a second-year PhD student under my supervision, I am particularly interested in resilience in supporting digital commerce activities through cloud services, the backbone of digital commerce. We have developed a framework and related metrics for managing cloud service crises. Current works have predominantly emphasized proactive measures (such as implementing intrusion detection systems) and reactive measures (such as establishing crisis response workflows). We seek to advance the discourse by proposing that crises can have an incubation period that culminates in abrupt occurrences. By emphasizing early detection, we can facilitate interventions during the incubation phase of potential crises. Preliminary findings from this study have been presented at the *International Conference on Information Systems* 2024.

- "Unraveling Incubating Cloud Service Crises," with J. Q. Ding, *manuscript in writing*.

[2] Digital Organization

I am eager to expand my research on the role of IS in building digital organizations, focusing on two interrelated areas. The first area is technological innovation. One paper currently under revision for the fourth round review at the MIS Quarterly, stemming from the thesis work of a former PhD student I supervised, explores how financial incentives could be integrated within the open-source community to accelerate application development by securing commitments from community developers and investors. I am also working with a PhD student to examine how IS can be innovated to enhance inter-organizational collaboration among non-profit agencies responding to natural disasters in Southeast Asia. With support from key disaster management agencies, we investigate how IS can be deployed to assist responders in their missions in this dynamic environment. Our preliminary findings have been presented at international conferences, including ICIS 2024, 2023, and CIST 2022.

- "Financing and Financial Incentives for Blockchain Application Development with Open-Source Developers," with Aseem Pahuja and Guo, Z. L., under revision for fourth round review in *MIS Quarterly*.

- "In-situ Actions in Natural Disaster Responses: IT Bricolage," with Puspa Indahati Sandhyaduhita, *manuscript in writing*.
- "Role Construal and the Consequential IT Use in Natural Disaster Responses," with Puspa Indahati Sandhyaduhita, *work-in-progress*.

The second area in which I am working with two of my PhD students and collaborators is to extend the work stream on healthcare. With one PhD student, we look at innovating a virtual nursing care model in collaboration with a Singapore public hospital (initial results presented at the department's brown bag seminar in 2024). With another PhD student, we seek to innovate precision medicine using machine learning to address chronic disease management using personalized counterfactual outcome estimation (initial results presented at WITS 2024). In addition to these works, I have also collaborated with other researchers on healthcare.

- "Hierarchical Challenge in a Spontaneous Teleconsultation Team: Enhancing Participation Among Junior Physicians," with Yiqing Li, and Yu, T., under first-round review in *MIS Quarterly*.
- "Digital Access Divide Affecting Elderly Outpatients," with Yidan Xiang, Xu, H. F., Ding, Y., Tan, B. C. Y., and Zhang, P., under first-round review in *Information Systems Research*.
- "Decoding Status in Online Fitness Platform," with Xichen Guo, Goh, J. M., Yan, Z. J., and Yin, Q. J., under first-round review in *MIS Quarterly*.
- "Aiding Multifaceted Acute Care for Chronic Disease Patients: The CARE-ACD Model," with Ming Cai, *manuscript in writing*.

Evidence Related to Research Impact

<u>Research Productivity Analysis</u>

I conducted a comparative analysis of journal publications prior to and subsequent to my affiliation with the NUS as of January 2016. Since joining NUS, I have achieved publications, including seven papers classified as rank 1A, which are also recognized in the Financial Times 50 (FT50) and the University of Texas Dallas 24 (UTD24), as well as seventeen papers featured in the AIS Premier 11 Journals. This demonstrates a marked emphasis on publishing in top-tier journals in the field, in contrast to the three papers published in rank 1A and fifteen papers in AIS Premier Journals prior to my tenure at NUS. Furthermore, the number of papers co-authored with PhD students has significantly increased from six to eleven. Notably, most of my publications were completed without collaboration with the PhD thesis supervisor (86.36%; 19 out of 22) and without involvement of senior scholars in the field (54.55%; 12 out of 22).

Table 1. Summary of Research Paper Attributes

	No. of journal papers	Prestigious					Independence		Contribution	
		Premium journals (1A)[^]	Leading journals (1B)[^]	UTD24[#]	FT50[@]	AIS11[&]	Without supervisor	Without senior scholar	Supervising/supervised PhD student	First/Last Author
2016 and after (since joined NUS)	22	7	2	7	7	17	19	12	11	9
2015 and before	35	3	7	3	6	15	20	12	6	10

[^] based on the department journal ranking list; [#] Business School Top 24 Journals ranked by the University of Texas at Dallas; [@] Financial Times Top 50 Journals; [&] Association of Information Systems' Premier 11 journals.

Evidence Related to International Reputation and Visibility

<u>Salient Editorial Board Activities</u>

2023.01~now	Associate Editor, Information Systems Research
2016.01~2020.12	Associate Editor, MIS Quarterly *Recognition: Outstanding Associate Editor Award 2016*
2017.01~2019.06	Associate Editor, Electronic Commerce Research and Application
2012.02~2024.12	Editorial Review Board Member, JAIS *Recognition: JAIS Reviewer Hall of Fame 2020* *Recognition: Best Reviewer Award 2016* *Recognition: Honorable Mention 2015*
2011.08~now	Editorial Review Board Member, IEEE Transactions on Engineering Management

<u>Salient Conference Program Activities</u>

2026/23	Program co-chair, PACIS
2024	Doctorate consortium co-chair, PACIS
2015~2017	Program co-chair, HCI International (HCI in Business, Government, and Organizations)
2024	Track co-chair, International Conference on Service Science and Innovation (ICSSI)
2016/21/24	Track co-chair, ICIS
2011 and beyond	Track co-chair, PACIS (>8 times)
2009 and beyond	Associate editor, ICIS (>8 times)

<u>Invitations to Participate in Reputable Expert Panels or International Bodies</u>

2024.10~2026.10 URC Expert Panel, NUS

2022.10~2024.09 URC Expert Panel for Accountancy, Business, Humanities and Social Science, NUS

2022.09~2024.08 NUS Project Prioritization Committee Member, NUS

2019.10~2022.09 Resident member of the URC Informatics and Mathematics (IM) Expert Panel, NUS

Other Evidence of Research Achievement

<u>Research Grants</u>

Principal Investigator

[Digital Organization]

[1] IT Use in Disaster Response Mission, AcRF Tier 1 (Jan 2023 ~ Dec 2025) – SG$189,000

[2] Garnering Open Source Development Contribution Through Firm and Community Partnership, AcRF Tier 1 (Jan 2020 ~ Dec 2022) – SG$145,000

[3] IT and Innovation: An Investigation of Small and Medium Enterprises, National University of Singapore, AcRF Tier 1 (Oct 2016 ~ Sep 2019) – SG$116,000

[4] Open Source Software Project and its Community of Projects and People: Implications on Innovation Performance, AcRF Tier 1 (March 2016 ~ February 2019) – SG$150,000

[5] SSRTG - RIDE (Research on Innovating in a Digital Economy), MOE Social Science Research Thematic Grant (SSRTG) (Oct 2018 ~ Sep 2021) – SG$5,188,640 *[Co-PI]*

[Digital Commerce]

[6] Decision making with both physical and digital worlds: Users' choice behavior with the mobile context-aware computing devices; CSMR business/industry-related project grant, City University of Hong Kong (2014 ~ 2015) – HK$99,511 (in collaboration with Beijing Zheng-He-Da-Yuan Co. Ltd)

[7] A Design Perspective for Enhancing and Maintaining User Engagement in Software Games; Earmarked research grant, Hong Kong Research Grant Council (2014 ~ 2015) – HK$222,554

[8] Understanding Online Consumer Behavior Through Clickstream Data Analysis; Seed Grant, City University of Hong Kong (2012 ~ 2013) – HK$79,185

[9] Observing and Analyzing Mobile Users' Behaviors through Embedded Monitoring Application; Applied Research Grant, City University of Hong Kong (2012 ~ 2013) – HK$170,870 (in collaboration with iResearch consulting group)

[10] Should I Buy Together with Everyone Else in a Group? The Deployment of Online Technology to Foster Interdependent Procurement Actions; Earmarked research grant, Hong Kong Research Grant Council (2011 ~ 2013) – HK$396,302

[11] Effects of Product Reviews and Web Advertisement Cues on Consumer Procurement; Strategic research grant, City University of Hong Kong (2011 ~ 2013) – HK$133,816

[12] Designing Mobile Social Network Applications for Effective Dissemination of Commercial Messages: The Social Network Paradigms Perspective; Earmarked research grant, Hong Kong Research Grant Council (2010 ~ 2012) – HK$411,810

[13] Shopping Cart Abandonment: How an Online Consumer-based Shopping Website Alleviates Purchase-Avoidance Propensity; Strategic research grant, City University of Hong Kong (2010 ~ 2012) – HK$117,788

[14] Research on Online Decision-Aiding Design; Strategic start-up grant, City University of Hong Kong (2008 ~ 2011) – HK$400,000

Co-Investigator

[Digital Organization]
[1] SIA-NUS Digital Aviation Corporate Laboratory – SG$45 million, work package 2 (current)

[Digital Commerce]
[2] National Science Foundation of China, Technology-enabled Firm-Consumer Interaction in Online Professional Services: A Social Perception Perspective (RMB 400,000; 2024.08 ~ current; Huazhong University of Science and Technology)

[3] National Science Foundation of China, 在线个性化定制系统的设计特性对消费者定制行为的影响研究 (RMB 2,152,000; 2014 ~ 2018; Renmin University as the hosting university)

[4] Institutional partnership, Sino-Swiss Science and Technology Cooperation (IP-14-092009; 2010 ~ 2011)

Research/Design Awards and Prizes

Year	Award	Remark
2023	China Information Economics Society Innovation Achievement Award (Information Management Category)	A country-level competitive award was conferred in recognition of a paper published in the MIS Quarterly 2022, which conducted a multi-level analysis of the impact of Information Technology on addressing the challenges of rural-urban access inequality in healthcare.
		The China Information Economics Society establishes the China Information Economics Innovation Achievement Award annually to recognize outstanding achievements in China's information economy and information management. This award is recognized as one of the most academically influential awards in China's information economy and information management. Each category selects six winning papers.

		Contribution: I contributed to the research by problematizing, theorizing, and conducting multi-level qualitative data analysis. Additionally, I am heavily involved in the writing of the paper, including the revisions during the journal review process.
2018	Best Paper Award, AIS SIGHealth	A competitive award was conferred in recognition of a paper published in Information Systems Research in 2017 on theorizing direct and indirect IS use in healthcare.
		AIS SIGHealth is a special interest group on IT in healthcare. Only one best paper award is given per year.
		Contribution: I contributed to the problematization, theorization, analysis, and writing (including revisions) of the paper.
2013	INFORMS ISS Design Science Award, Outstanding Design Science Project	A highly competitive award was conferred by INFORMS on the best design science research in 2013. It was in recognition of a paper published in MIS Quarterly 2013 on smartphone application design to address the personalization-privacy paradox.
		The INFORMS ISS Design Science award recognizes research efforts centered on the design and realization of innovative IT artifacts.
		Contribution: I contributed to the paper's theorization, research design, data analysis, and writing (including revisions).