Editor's Comment

Brief Reflections on the Journal, the Concepts of Systems, Technologies, Use, Cybernetics, and the AJIS Volume 26

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The final articles for the year 2022 of the Australasian Journal of Information Systems have been published; a the complete volume 26 of the journal is now avaialble.

In last year's editorial I formulated my understanding of the information systems (IS) discipline and research based on Lee's editorial comments on IS research in *Management Information Systems Quaterly* (MISQ) (Lee, 2001) as a foundation of my vision and of the (future) scope of the AJIS. I also expressed a desire to receive more submissions based on Alvesson and Sandberg's (2011, 2013, 2014) problematization research approach: "research that is assumption-challenging and deals with surprising phenomena instead of being confirmatory and founded on mere gap-spotting." (Kautz, 2021)

It is therefore affirming to read Chatterjee and Davison's (2021) editorial plea for compelling problematization in IS research in the *Information Systems Journal* (ISJ) as well as the MISQ editor's comments on qualitative research methods in IS including a call for phenomenon-focused problematization (Monteiro et al., 2022) which is based on the MISQ Knowledge Sharing online sessions 2022 on Qualitative Research, in one of which I had the opportunity to participate.

Further based on the journal's published articles I also sketched out some reasons for desk rejections. In this context Professor Yogesh Dwiwedi, the current Editor-in-Chief of the *International Journal of Information Management* (IJIM) and colleagues in a recent editorial of the IJIM (Dwivedi et al., 2022), likened submitting to a journal to participating in a conversation and that, beyond lack of fit with a journal's scope, not participating in a journal's ongoing conversation and not being connected with the existing research conversations in a journal through a demonstrated lack of familiarity with existing work published in the target journal increases the risk of a desk reject. I highly recommend these three editorial to all IS researchers, who seek support for their development of quality research articles.

After some years of online gatherings in 2022 it became possible again to meet in person for workshops, seminars, and conferences and in the second half of the year I attended four such events: Digital Futures, an event by the Disrupt.Sydney conference series at the University of Sydney, Australia (disruptsydney.net) (I really recommend this series to you if you are interested in challenging common sense, in learning about new ways of thinking, and in critically engaging with our disicipline); the Australian Cybernetic 2022 event at the Australian National University (ANU) (cybernetics.anu.edu.au) in Canberra (more about it later); the Australasian Conference on Information Systems (ACIS) at the University of Melbourne, Australia; and the International Conference on Information Systems (ICIS) in Copenhagen, Denmark under the auspices of the Association of Information Systems. It was a wonderful

and longed after experience with algorithms, algorithmic management, machine learning algorithms, and quite some focus on artifical intelligence (AI) everywhere. So, the jester role I had taken on earlier (see Kautz and Jensen, 2013; Kautz, 2018) resurfaced as I could not withstand the temptation of testing the application and consequences of generative AI and of asking the OpenAi chatbot ChatGPT, GPT standing for Generative Pre-trained Transformer (https://openai.com/blog/Chatgpt/) to 'Write me an Australian Journal of Information Systems Editorial'. The result is below and I leave it to the learned reader to judge the outcome and compare it with my current efforts.

Dear readers of the Australian Journal of Information Systems,

We are pleased to present the latest edition of our journal, which features a diverse range of research on the latest developments in the field of information systems.

In this edition, we have a number of thought-provoking articles that explore the intersection of technology and society. One article examines the ethical implications of using artificial intelligence in decision-making, while another looks at the role of social media in shaping public opinion.

We also have articles that delve into the technical side of information systems, including a study on the use of blockchain in supply chain management and an analysis of the security risks associated with cloud computing.

We hope that these articles will spark discussions and encourage further research on the many exciting and complex issues facing the field of information systems today.

Thank you for your continued support of the Australian Journal of Information Systems.

Sincerely,

[Your Name]

Editor-in-Chief, Australian Journal of Information Systems

Figure 1. ChatGPT's Editorial for the AJIS created on December 29, 2022

Another observation, I might rather call it a surprise in the spirit of problematization, that was triggered by the participation in these events and my work with the journal during the last years is what Avison (2018) so aptly described in the context of teaching IS as "One problem that seems to be always with us is the confusion that students have in differentiating IS from ICT." (Avison, 2018, p. 28). I see this problem, beyond in teaching IS, as the IS community's continuous struggle to conceptually keep IS and technology, information technology (IT), or to use the term from Avison's quote above Information and Communication Technology (ICT), apart and, as I will point out below, to adequately deal with the concepts of use, user, and usage in the IS discipline.

This made me look at some definitions of IS starting with those made by or quoted by Avison. With Wood-Harper in their exploration of IS development the authors write "An information system can be defined as: **'a system to collect, process store, transmit, and display**

information.'"[1] (Avison and Wood-Harper (1990, p.3) and continue quoting one of the founders of the IS discipline who defines an IS as: "an **integrated man/machine system** for providing information to support the operations, management and decision making function in an organization. The system **uses computer** hardware, **software**, **manual procedures**, management and decision models and a data base." (Davis, 1974) where a man /machine system consists of "**information technology** and people's activities in preparing and **using information.**" (Davis 1983)

Key concepts of information systems such as data, information, and systems are among others also defined by Avison and Fitzgerald (1988) in their classic textbook '*Information Systems Development – Methodologies, Techniques & Tools*' here cited in its 4th (MacGraw Hill) 2006 edition. This publication contains a definition of an information system by Buckingham et al. (1987), who declare that an information system is "A system which assembles, stores, processes and delivers information relevant to an organisation (or to society), in such a way that the **information** is accessible and useful to those who wish to **use** it, including managers, staff, clients and citizens. An information system is a **human activity (social) system** which may or may not involve **the use of computer systems**."(Avison and Fitzgerald, 2006, p. 23)[2]

Checkland (1981, p. 314) had earlier defined a human activity system as "A notional **purposive system** which expresses some *purposeful* human activity, activity which could in principle be found in the real world. Such systems are notional in the sense that they are not descriptions of actual real-world activity (which is an exceptionally complex phenomenon) but are intellectual constructs; they are *ideal types* for use in a debate about possible changes which might be introduced into a real-world problem situation."

Finally, I turned to Nygaard (2002), who based on 40 years of engaging with systems thinking elaborates on the concept of system as: "Nothing is *inherently* a system, but we may state that part of the world is a system to us when we study it using a *system perspective*. A *system* is a part of the world that is regarded a whole with: • its *substance* consisting of *components*; • each component's *state* characterized by the states of *properties*, called *attributes*, that are selected as being relevant; and by • *state transitions* relating to these attributes and other components and their attributes … *No single perspective is sufficient when one is considering the development and use of an information system*. … the study information systems in their social and organizational context remains at the heart of the discipline of informatics." Nygaard (2002, pp. v – x)

For me these definitions together present the essence of our field. They have led me and, beyond those cited above, others to the position that humans, human actors are not merely using systems, or in our context IS, but are active parts of them and use certain IT, which are also part of these systems. This is in line with Lee's (2001) comments referring to the sociotechnical phenomena that set our field apart and Sarker et al.'s (2019) explanation of the sociotechnical perspective on IS, in which the social component includes humans as individuals or social collectives. Unfortunately, this position is not been held consistently, not even by those putting it forward. In

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[1] All bolding in the used citations has been made by me to put emphasis on the respective concepts, in contrast all italics appeared in the original texts.

[2] While the use of computer hardware and software as well as the use of computer systems are stated in the chosen definitions, the term IT system which is otherwise used regularly in colloquial language does not appear in the selected sources and would warrant a broader literature review and analysis including whether, and if yes, when and how 'IT systems' became 'information systems'.

some cases it remains unclear whether avoidance of the concept of IS was intended and conscious or, perhaps just accidental, unconscious and unintentional.

For example, Lamb and King (2003), although otherwise avoiding the concept of IS use, list the key word '**IS users**' in their argument for reconceptualizing users as social actors and refer to ICT and information service use when writing: "Despite pervasive **ICT use**, social actors are not primarily users of ICTS. Most people who use ICT applications utilize multiple applications, in various roles, and as part of their efforts to produce goods and services while interacting with a variety of other people, and in multiple social contexts. Moreover, the socially thin user construct limits our understanding of information selection, manipulation, communication, and exchange within complex social context. Using analyses from a recent study of online **information service use**, we develop an institutionalist concept of a **social actor** whose everyday interactions are infused with ICT use. We then encourage a shift from the user concept to a concept of social actor in IS research." (Lamb and King, 2003)

More recently Halskov and Hansen (2015) in a study of the Participatory Design community, while still referring to use situations, report that in the participatory design (PD) community the idea of the 'user' has been challenged and that rather the concept of 'people' should be considered as a fundamental aspect of PD. I myself have done that but also neglected to resolve the issue whether IS are 'used' when writing "Participatory design (PD) is a design approach in which the participation of **people** in the co-design of the **information systems** and **information technologies** (IS/IT) they are supposed to **use** themselves is a central tenet." (Kautz, 2011) and even more recently in Kautz and Bjerknes (2021) nearly conflating the concepts of IS and IT when writing about user participation in distributed participatory design.

To side-step such inconsistencies, Riemer and Johnston (2012) for instance avoid the concept of IS and IS use entirely in their research on technology appropriation. They set the concept of technology appropriation against the conventional IT adoption concept, and apply the concept of "**IS technology appropriation**" in their phenomenological study (see Heidegger, 1927, 1962) of an unfolding technology appropriation and its emerging use. They qualify the technology in question as (enterprise) social media and use the term social media technology as well as the label social media platform, but make no additional mention of the terms system or information systems. They otherwise distinguish "**IT** as an object of inspection and reflection from **IT** as it is **in use**", captured by Heidegger's concept of equipment and propose to interpret technology appropriation as the change of IT from an object evaluated by users upon first encounter to equipment when it is transparently implicated in a practice. They also shun the concept of IS use by consistently referring to IT use when further discussing the usefulness of Heidegger's concept of equipment for the IS discipline (Riemer and Johnston, 2017).

Yet others promote a different understanding of systems, IS, and the concept of use or usage. Acknowledging other views on the concept of IS as a foundation for IS research, Burton-Jones and Straub (2006) put forward the system usage construct and argue that has played a central role in IS research and that many studies have employed other constructs among others information usage as proxies for system usage. In their view "**information usage** is a useful construct, but it is not identical to **system usage**." For the purpose of defining system usage they state that "system usage is an activity that involves three elements: (1) a **user**, i.e., the subject **using the IS**, (2) a **system**, i.e., the object **being used**, and (3) a task, i.e., the function being performed." (Burton-Jones and Straub, 2006, p. 231). They further

define an IS as an artifact that provides representations of one or more task domains. In extension Burton and Grange (2013) clarify that their understanding of IS use is grounded in representation theory and its particular view on IS as detailed by Weber (1997).

The background for their work is among others the theory of task-technology fit that theorizes "the interdependence between an individual (**a technology user**), technology (data, hardware, software tools and the services they provide) and task (activity carried out by individuals to produce the required output) characteristics." (Marikyan and Papagiannidis, 2022 referring to the influential work of Goodhue and Thompson, 1995) and which according to https://is.theorizeit.org/wiki/Task-technology_fit (accessed December 29, 2022) holds that "**IT** is more likely to have a positive impact on individual performance and be used if the capabilities of the **IT** match the tasks that the user must perform." The concept of IS use does not appear here, the technology user applies or uses IT. Whether this a deliberate or unintentional decision and choice by the authors is not clear.

In the same vain, Goodhue and Thompson (1995) themselves contextualize their work by stating that "**Technologies** are viewed as tools used by individuals in carrying out their tasks. In the context of information systems research, technology refers to **computer systems** (hardware, software, and data) and user support services (training, help lines, etc.) provided to assist users in their tasks." But otherwise they hypothesize about "the **utilization of information systems**". This, unfortunately does not resolve the confusion, or possible conflation, regarding the concepts of IS and IT.

Regrettably, this is also valid for a recent update of the MISQ curation on IS use – also covering some IT adoption literature - where Burton et al. (2020) put forward the foundations of knowledge in IS use to be found in work on the "application, refinement, and integration of various social psychological explanations of **IT acceptance and use**" and set it against unpacking the complexity of the concept by advancements in exploring "different theories to account for the characteristics of **IS use** dynamics (emergence, interdependence, emotions, power, etc.)." which maintains the, from my perspective, unfortunate commingling of the concepts.

In this context Ciborra (2002, p. 1) laments that "The current descriptions of the **design, implementation, management, and use of information technology** in organizations (**in short information systems**) are largely founded on notions of rationality, science, and method … [the essays in this volume] point to an alternative centre of gravity: human existence in everyday life." Sadly, in the above text fragment he also remains ambiguous about whether IT is a synonym or a component of an IS. In contrast, Riemer and Johnston's (2012, 2017) framing of IT appropriation and evasion of the concept of IS use and IS user as introduced above is based on Heidegger's philosophy and phenomenological analysis of everyday human engagement and a critique of representationalism[3].

Finally, in an early reflection on the tension between IS and IT based on human existence Langefors (1980) contrasts what he calls data systems (and data processing concepts) with IS (concepts) and argues that data systems do not carry information and that the concept of user,

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[3] Further representational framings of IS phenomena set off against nonrepresentational modes of theorizing IS related phenomena are discussed in Cecez-Kecmanovic et al. (2014), such a discussion however goes beyond the scope of this editorial comment.

in his words, the concept of user view delimits the concept of information systems to merely focussing on representation, structuring, and exploitation of data while ignoring significant socio-psychological challenges, socio-linguistic aspects, and socio-technical issues of IS. As a result of his assessment of the – in his nomenclature – datalogical trait of a user view, he promotes an infological perspective on IS, which goes beyond the identified limitations and does not employ the term user. He does not offer an alternative term and his infological view has not gained much traction in the wider IS community, but it provides an early call to pay close attention to the concepts of system and IS, data, information, and 'user' in the context of IS. More than 40 years after the publication of Langefors' (1980) reflections there is still conceptual groundwork to do and efforts to make to break the everyday habit of simply calling something a system.

This and Nygaard's (2002) reference above to Informatics[4] , brings me back to my participation in Australian Cybernetic 2022 event including the launch of the School of Cybernetics at ANU, which had been triggered by my attendance at Disrupt.Sydney. It also connects me to my past as I have been studying at, and graduated from, a Faculty of Informatics at the Technical University Berlin in Germany from the mid 1970ties. That Faculty then had only recently changed its name from Cybernetics to Informatics[5], its curriculum was still very much impacted by the former. However, instead of discussing the distinction between these concepts here – a topic which also would deserve some attention in the context of IS – I rather share some thoughts on what is called the 'New Cybernetics: Systems Thinking for the 21st Century' (https://cybernetics.anu.edu.au/news/2022/03/28/the-new-cybernetics-systems-thinking-for-21st-century/) and is explained in two publications by members of the new ANU school (see, Bell, 2021; Gould et al., 2022).

Bell (2021) provides background and reminds us that as a form of systems thinking and as a systems methodology, cybernetics dates back to the 1940s (see Wiener, 1948) and is strongly linked to the rise of the computer. Cybernetics is the science of steering or control, and persuasively argues the importance of the relationship and of the feedback loops between humans, computing and the ecological in holistic systems, also called cybernetic systems**.** It is an interdisciplinary field that recognises the diversity of voices when identifying and building systems.

As such Bell (2021) promotes cybernetics and the concept of cybernetic systems as a tool and an approach to understand and form possible futures and to design future systems, above all as a means to take AI safely, sustainably, and responsibly to scale in cybernetically informed and digitally transformed societies and organizations.

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[4] Informatics is the study of the structure, behaviour, and interactions of natural and engineered computational systems. Informatics studies the representation, processing, and communication of information in natural and engineered systems. It has computational, cognitive and social aspects. The central notion is the transformation of information - whether by computation or communication, whether by organisms or artifacts. (https://www.ed.ac.uk/files/atoms/files/what20is20informatics.pdf, accessed December 29, 2002). A further discussion about the origin of the concept and its relation to business informatics and its distinction from (business) IS would be interesting; however it is beyond the scope of the current text.

[5] To add even more concepts to this editorial comments: in a changed form as part of an Informatics Faculty now called 'Computer Science' it resurfaced in a different incarnation as a Department Control Systems (https://www.tu.berlin/en/control).

One particular cybernetic concept, the concept of productive discomfort (Bell, 2021; Gould et al. 2022) – i.e., giving room to diverse voices – has driven these editorial contemplations as an invitation to the readers and contributors of the AJIS to continue the debate about the core concepts of our discipline.

With these reflections as a timely reminder that the study of systems and IS as a specific instance of systems is not limited to, and does not only happen in, the confines of business schools and departments performed by business IS academics and specialists I like to return to volume 26 of the journal.

In 2022 the journal received 215 submissions and published 22 articles, 13 in the regular research articles section, one article in its section on Green IS/IT, four articles and an editorial in a section on Applied Ethics, and four in the section for Selected Papers from the Australasian Conference on Information Systems (ACIS). The author teams came for all three regions of the AIS, with the majority coming from region 3 (Asia, Pacific) and here more precisely from Oceania.

The topics in the ACIS special section covered current subjects such as employees' perceptions of robotic automation when robots join work teams, digital transformation with Digital Kaizen, sociomaterial practices in digitally supported water management, and gender bias in artificial intelligence presented in three case studies and one extended literature review. The Applied Ethics section included the contemporary topics of privacy concerns in COVID-19 tracing apps, of social media analytics, and of social media user (see the reflections above) behaviour with their research methods comprising a case study, a systematic literature review, a design science approach, and a quantitative survey. The latter approach was also applied in the Green IS/IT publication on the present-day subject of environmental sustainability and its relation to internet consumption.

Hypothetico-deductive approaches and/or quantitative survey questionnaires as well as a quantitative test instrument were used to study digital leadership, social media use by vulnerable persons in the context of disaster, student engagement in online education, turnover of IT professionals in Japan, and diagnosing phishing emails in five of the 13 regular research articles. Web scraping Instagram to comprehend customer engagement and textual tweet analysis to explore the role of emotion in privacy concerns of tracing apps, both in the explicit context of COVID-19 were two further quantitative approaches that were deployed, while qualitative interviews were used in two studies to deepen the understanding of process stories as part of business process modelling and of value creation in SMEs through business intelligence, respectively, and one article presented a mixed method approach to research social media use and older adults life satisfaction. The remaining three pieces consisted of a conceptual study of challenges and opportunities brought about by pervasive sensing technology in smart work environments, a systematic literature review on the impact of blockchain on supply chains, and an econometrics approach to analyse ICTs' impact on human development in South Asia.

Together the articles present recent and established topics and again a healthy mixture of well-known conceptual, quantitative and qualitive, positivist and interpretive, and in one case critical sociomaterial research methods and emerging text analysis and website extraction approaches; all in line with the methodological pluralist positioning of the journal.

As an aside as we have been running some basic analytics regarding the resolution of the DOIs (clicks on DOIs referring to articles in the journal) of the 828 published articles in the journal since its inception, the interest in the journal has steadily increased; in 2020 we count around 55000 resolutions, in 2021 around 75000 and in 2022 around 90000, on average 7500 resolutions per month, and 804 articles in our archive and current volume have at least been accessed once during the last year. This has only been possible through the work of numerous previous and current volunteers and brings me to express my gratitude to the colleagues, who led their review teams and served as section editors for the 2022 journal submissions; their names are listed below after this editorial's reference list.

Finally I like to thank the IS community and beyond for their continuing support and interest in the journal and look forward to all your further engagement with the AJIS in the coming year.

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