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## What is paradox in Information Systems research? Towards a narratology

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# What is paradox in Information Systems research? Towards a narratology

## Research-in-progress

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## Abstract

Paradoxes are intriguing narrative devices, enabling information systems (IS) researchers to develop captivating stories that encapsulate the richness of the emergent socio-technical phenomena they study. However, existing paradox research in IS has been fragmented by incoherency around the meaning of the term 'paradox'. To help provide greater consistency and clarity, this paper works towards a narratology of paradox in IS. We review the existing IS paradox literature as captured in a sample of 139 publications in IS and related journals. In the first round of analysis, we identify six archetypes of how authors engage with paradoxes: complication, resolution, adaptation, problematisation, explanation, and exaptation. In the second round of analysis, we inductively code the different patterns in which narratives about paradoxes unfold in the existing IS paradox literature. Our framework, when completed, can help aspiring authors of IS paradox papers more clearly articulate their contribution.

**Keywords:** paradox, narratology, storytelling, theory-building, literature review

## 1 Introduction

Information Systems (IS) phenomena often appear to entail paradoxes, typically referring to characteristics of interrelated contradiction, opposition, or absurdity (Poole and Van de Ven 1989; Smith and Lewis 2011). Authors of IS research that takes on paradox-based theoretical lens have articulated phenomena such as the productivity paradox (Brynjolfsson 1993) and the personalization-privacy paradox (Awad and Krishnan 2006). In recent years, IS scholars increasingly draw on “paradox theory”, based on the work of Smith and Lewis (2011). Such enduring relevance of paradox as a theoretical framing affirms the conceptual versatility of paradox for studying IS phenomena — and yet, these very examples point to a potential incoherency around the term ‘paradox’.

On one hand, paradox research in IS may refer to ‘paradox’ as something appearing — seemingly irreconcilably — absurd or unreasonable. This conceptualisation of paradox aligns closely with the Greek etymology of “paradox”, παράδοξος (*paradoxos*): “contrary to cognitive expectations” (Kanellakis 2020). The presence of this kind of paradox in IS research reflects the historical connection between IS and technically oriented disciplines like computer science (Hirschheim and Klein 2012), which continues to study logical and mathematical ‘paradoxes’ such as the ‘birthday paradox’ (Epstein 2023). The classic paradoxes of the IS discipline are situated here. For example, the productivity paradox (Brynjolfsson 1993) draws attention to the absurdity that increased investment in information technology (IT) — quite reasonably expected to improve productivity — does not then improve productivity. Likewise, the personalisation-privacy paradox (Awad and Krishnan 2006) draws attention to the absurdity that people can claim to profound care about their privacy and yet be willing to sacrifice it, leading us to the theory of privacy calculus (Pavlou 2011).

On the other hand, paradox research in IS may refer to ‘paradox’ as in the ‘paradox theory’ or ‘paradoxical tensions’ in management research. This conceptualisation of paradox, popularised by Smith and Lewis (2011), refers to “*contradictory yet interrelated elements that exist simultaneously and persist over time*” (p. 382). The presence of this kind of paradox in IS research reflects the historical connection between IS and socially oriented disciplines like management and organisation studies (Hirschheim and Klein 2012). This kind of paradox is very different to the ‘paradox’ of the classic IS paradoxes like the productivity paradox and the personalisation-privacy paradox. The presence of contradictory interrelated and persistent elements is not ‘*paradoxos*’ absurdity. Instead, this kind of ‘paradox’ is broadly and vaguely embedded in material artefacts, human interpretations, and social arrangements (Hargrave and Van de Ven 2016), exemplified by ambidexterity (Andriopoulos and Lewis 2009; Papachroni and Heracleous 2020) and by dynamic relationships, actions and interactions (Fairhurst et al. 2016).

The presence of these two thematically similar but semantically distinct meanings of ‘paradox’ becomes a problem particularly in the IS discipline, where social disciplines like management, and technical disciplines like computer science, coalesce (Sarker et al. 2019). On one hand, this encounter brings intellectual diversity and defines us as a discipline (Sarker et al. 2019). On the other hand, scholars of ‘paradox’ have warned that overly broad use of the term “*risks conceptual confusion or even meaninglessness*” (Schad et al. 2019, p. 108), complicating efforts to author and review a ‘paradox’ paper, especially for early career scholars. Given the prominence of ‘paradoxical tensions’ view from management (e.g., Berti et al. 2021; Lewis 2000; Poole and Van de Ven 1989; Smith and Lewis 2011) — it may become increasingly challenging to avoid “*premature convergence on theoretical concepts, overconfidence in dominant explanations, and institutionalizing labels that protect dominant logics*” (Cunha and Putnam 2017, p. 95). Yet, so far, this vast literature on ‘paradox theory’ is the best that could be offered to students, authors, reviewers and editors, even if at the risk of overlooking other kinds of paradoxes. In an effort to provide guidance that embraces both kinds of paradoxes, our ongoing research project strives to elucidate a framework for paradoxes in IS research. We ask: (RQ1) **How do IS researchers engage with paradoxes?**

Our first attempt to answer this research question took an analytical, typological approach. Yet, as we considered our emerging work relative to well-known paradoxes in the public consciousness — like Zeno’s paradoxes (Huggett 2019), the barbershop paradox (Carroll 1894) and even Schrödinger’s cat (Ryan 2011) — we realised that these paradoxes are all *stories*. We wondered if, perhaps, all paradoxes could be understood as stories unfolding rather than as static analytical cuts of entities and their properties. Essentially, we recognise the potential of a narratological, rather than analytical-typological framework. Narratology is the study of how narratives and stories are constructed and how they convey meanings. For IS researchers investigating paradoxes, a narratological approach offers insights into how paradoxes can be presented, structured, and understood within the IS community, shedding light on the underlying socio-technical arrangements and narrative structures behind these paradoxes. Thus, a

narratology of paradoxes could help IS researchers to better communicate, critique, and build upon existing paradox literature in the field (Czarniawska 2004; Davison 2016; Pentland 1999). We hence ask: (RQ2) ***How do narratives of paradoxes unfold?***

## 2 Literature Review and Rounds of Analysis

We reviewed the existing paradox literature in IS by first constructing a representative sample of papers. To locate relevant papers, we searched for peer-reviewed journal papers in the field of IS research that explicitly engaged with paradoxes. We considered an inclusive range of 50 renowned journals in IS and related disciplines, based on various journal rankings, such as the AIS Senior Scholars' Premier list and top-ranked journals in the Australian Business Deans Council list, as well as journals that are likely to publish paradox-based inquiries. We searched the Scopus database using the query: "*paradox AND (information OR digital) AND (system OR technology OR management OR organization OR organisation)*". Our search through the Scopus database returned 202 unique results. We then sought to exclude papers that focus on managerial phenomena with no relation to digital technology, or where digital technology played only an incidental role in the paper without contributing substantially to the paradoxes that were studied, resulting in 139 papers in our sample for analysis. An online listing of these papers can be accessed at: [https://osf.io/mb6yk/?view\\_only=2f7f8042a9c940c582f5c4cc52164ae7](https://osf.io/mb6yk/?view_only=2f7f8042a9c940c582f5c4cc52164ae7)

We subsequently embarked on two rounds of analysis of these 139 papers. In the first round of analysis — already fully completed — we classified the literature according to emergent categories of “perspective on absurdity” and “exploration of absurdity”, revealing ways in which authors engage with paradoxes, thus answering RQ1. In the second round of analysis — currently ongoing — we are performing an inductive analysis of different patterns of narratives about paradoxes, resulting in a tree-like structure, revealing ways in which narratives of paradoxes unfold, thus working towards answering RQ2.

## 3 Analysis Round 1: How Do Authors Engage with Paradoxes?

In our first round of analysis — already completed — we classified the literature according to the emergent categories of “perspective on absurdity” and “exploration of absurdity”, generating six archetypes of how authors engage with paradoxes. The outcome of this analysis is detailed in the text below and also depicted in Table 1, situated within this text below.

We began by reading each of the 139 papers in our sample. Based on our reading and based on an interpretivist epistemology, we classified each paper according to the categories of “perspective on absurdity” (professional vs. scholarly) and “exploration of absurdity” (exposing, responding, reframing). We performed this work based on our human interpretation, with no input from any automated text mining or similarly algorithmic toolkits. The codebook defining these categories is provided as follows:

- **Category → Perspective on absurdity:** The way in which there is something absurd about the phenomenon in question. Aligning with the notion of absurdity in existentialist philosophy referring to the dissonance between the human desire for meaning and the inherently chaotic nature of the universe (Camus 1942; Sartre et al. 1943), these are necessarily subjective “perspectives”, rather than something existing objectively in external reality. *Boundary clarification:* Of course, the phenomena underpinning paradoxes, particular professional paradoxes, do exist in the external reality (Hahn and Knight 2021); but our point is that the absurdity is bound by subjectivity.
  - **Option 1 → Professional:** When the paper is primarily about practitioners facing competing courses of action that individually seem worth pursuing but undermine each other. Professional absurdity is the category exemplifying “paradox theory” (Berti et al. 2021; Smith and Lewis 2011), e.g., managerially imposed contradictory demands that must be disobeyed to be obeyed (Cunha et al. 2023).
  - **Option 2 → Scholarly:** When the paper is primarily about researchers encountering competing knowledge claims that appear well-founded and reasonable in isolation but would be absurd if both were true. Scholarly absurdity is the category exemplifying ‘paradoxos’ absurdity — encountered, for example, when new evidence emerges contradicting entrenched widely-held beliefs or established scientific theories — and provoking the creation of new knowledge. *Boundary clarification:* Scholarly absurdity is more than simply ‘counter-intuitive’: it is not merely when a well-founded and seemingly reasonable knowledge claim contradicts instincts or conjecture, but when it contradicts another likewise well-founded and reasonable knowledge claim.

- **Category** → **Exploration of absurdity**: How the author engages with the professional or scholarly absurdity that has been identified.
  - **Option 1** → **Exposing**: Bringing to attention to a new paradox, or the instantiation of an existing paradox in a new setting; it could be based on new empirical evidence introduced by the IS paradox publication, but it could also be based on the reconsideration of existing empirical evidence. *Boundary clarification*: Contradiction between new empirical evidence and prior knowledge is not itself a paradox, since this is how theories are tested and corrected (Poole and Van de Ven 1989); the paradoxicality of new evidence is relative to its absurdity (Berti et al. 2021; Smith et al. 2017; Tennant 1995).
  - **Option 2** → **Responding**: Addressing an existing paradox. Here we do not mean that the paradox can be always conclusively eliminated, but rather, it may be better understood or accepted in such a way that is constructive (Poole and Van de Ven 1989).
  - **Option 3** → **Reframing**: Conceptualising an existing paradox into a completely new domain. Researchers can use empirical or theoretical insights from one context to shed light on paradoxes in another context (Bartunek 1988).

The results of our coding are available at the “osf.io” URL in section 2. The combination of *perspectives on absurdity* (two possible options) and *explorations of absurdity* (three possible options) deterministically generates six archetypes of how authors engage with paradoxes, depicted in Table 1.

		PERSPECTIVE ON ABSURDITY	
		1. Professional	2. Scholarly
EXPLORATION OF ABSURDITY	1. Exposing	<p><i>Complication</i> archetype</p> <p>INDICATIVE EXAMPLE: Wimelius et al. (2021) exposing paradoxes of technology renewal in digital transformation.</p> <p>IN OUR SAMPLE: 20 papers (14% of total)</p>	<p><i>Problematisation</i> archetype</p> <p>INDICATIVE EXAMPLE: Mahrer and Krimmer (2005) exposing the middleman paradox of e-democracy.</p> <p>IN OUR SAMPLE: 39 papers (28% of total)</p>
	2. Responding	<p><i>Resolution</i> archetype</p> <p>INDICATIVE EXAMPLE: Mao and Benbasat (1998) responding to the production paradox (Carroll and Rosson 1998).</p> <p>IN OUR SAMPLE: 12 papers (9% of total)</p>	<p><i>Explanation</i> archetype</p> <p>INDICATIVE EXAMPLE: Gerow et al. (2014) responding to the alignment paradox (Tallon 2003).</p> <p>IN OUR SAMPLE: 55 papers (40% of total)</p>
	3. Reframing	<p><i>Adaptation</i> archetype</p> <p>INDICATIVE EXAMPLE: Gregor (2001) reframing the production paradox (Carroll and Rosson 1998) by reference to three other theories.</p> <p>IN OUR SAMPLE: 3 papers (2% of total)</p>	<p><i>Exaptation</i> archetype</p> <p>INDICATIVE EXAMPLE: Pinsonneault and Rivard (1998) reframing the productivity paradox by reference to Greek mythology, the Icarus paradox.</p> <p>IN OUR SAMPLE: 10 papers (7% of total)</p>

Table 1. Archetypes of how authors engage with paradoxes (Analysis Round 1 / RQ1). Each of the six example papers are discussed in sections below (sections 3.1 and 3.2).

An *archetype* is a concept used in various disciplines – such as history, psychology, and organization studies – often signifying an ideal form of something – a society, a personality type, or an organization. Here, we employ the term archetype in the Platonic sense, referring to the fundamental, idealised characteristics of an object, here, a narrative. As such, an archetype is an overarching model that approximates the reality of various narratives but does not capture any instantiation of narrative exactly, much like a map necessarily abstracts from the landscape it illustrates to facilitate easier navigation.

In other words, this is a model, an intentional simplification, a map: “[the] map is not the territory it represents, but, if correct, it has a similar structure to the territory, which accounts for its usefulness” (Korzybski 1933, p. 58). Other possible models could depict more than six kinds of paradoxical stories out there. However, these six archetypes already enable us to unearth and navigate the diversity in prior literature on paradoxes. To illustrate this point, we now turn our attention to providing — for each of the six archetypes — an in-depth discussion incorporating an indicative example sourced from our sample of 139 papers, identified in Table 1 and expounded below.

### 3.1 Engaging with Professional Paradoxes

The *complication* archetype emerges when authors take an *exposing* approach to professional absurdity. The indicative example here is Wimelius et al. (2021), on the topic of digital transformation. Based on a literature review and case study, the paper reveals the professional absurdities entailed by digital transformation: established technologies already comfortably in use vs. new technologies, pushing for the deliberate practices envisioned as part of digital transformation vs. the emergent unforeseen practices, and inner (internal to organisational) vs. outer contexts. These paradoxes are professional paradoxes because they represent competing courses of action (specifically, competing priorities) rather than competing knowledge claims: these findings do not contradict or challenge existing knowledge, and indeed, the authors point out that their findings are in line with the existing concept of virtuous cycles articulated by Smith and Lewis (2011). The complication archetype is expressed in the paper in the form of a timeline of the case study in which issues, paradoxical tensions, are explicitly identified for every step of the timeline (Wimelius et al. 2021, pp. 207-208). The paper introduces the name for these paradoxes: “paradoxical perspective on technology renewal in digital transformation” (p. 220).

In contrast, the *resolution* archetype emerges when authors take a *responding* approach to professional absurdity. The indicative example here is Mao and Benbasat (1998). That paper addresses the established production paradox (Carroll and Rosson 1998), referring to the paradoxical tension between learning how to use an information system vs. using that information system to produce output. This is a professional paradox because it represents competing courses of action. Specifically, the paper demonstrates that a technological innovation – contextualised access to domain knowledge – enables users of an information system to learn while doing. The resolution archetype is expressed in the paper in the form of an experimental (prototypical) system design; in other words, the answer to the paradox could be found in the form of technological innovation. In this way, the paper also exemplifies the opportunity for IS to address social issues with technological solutions, in line with the sociotechnical foundation of the IS discipline (Sarker et al. 2019).

Finally, the *adaptation* archetype emerges when authors take a *reframing* approach to professional absurdity. The indicative example here is Gregor (2001). That paper again addresses the production paradox (Carroll and Rosson 1998), but takes a different approach to this paradox and thus demonstrates the difference between *responding* to and *adapting* absurdity. The paper focuses a bit less on ‘solving the problem’ and a bit more on ‘understanding the problem’, in this case by focusing on constructing a theoretical framework. This theoretical framework is constructed by adapting the concepts of the production paradox to related theories and concepts, including Zipf’s principle of least effort (Zipf 1949), Simon’s concepts of bounded rationality and satisficing (Simon 1955; Simon 1956), and de Greef and Neerinx’s concept of cooperative problem solving (de Greef and Neerinx 1995). The *adaptation* archetype is expressed in the paper in the form of research questions about the people in general which are then answered in terms of specifics, e.g., “Do users of knowledge-based systems want explanations?”, “The answer to this question was that **in some cases** users did want explanations, **in particular when...**” (p. 102, emphasis added); in other words, introducing a new viewpoint that eliminates the absurdity-generating oppositions (Poole and Van de Ven 1989).

### 3.2 Engaging with Scholarly Paradoxes

The *problematization* archetype emerges when authors take an *exposing* approach to scholarly absurdity. The indicative example here is Mahrer and Krimmer (2005), addressing the topic of e-democracy. Based on case studies of the Austrian public sector, the paper reveals that “*the same parliamentarians who would be responsible for introducing new forms of citizens’ participation for political decision-making are explicitly and implicitly opposing these reforms*” (Mahrer and Krimmer 2005, p. 38). This problematization challenges the assumption that democratically elected representatives would necessarily be supportive of further direct democratisation mediated by digital technologies. This is a scholarly paradox because it represents a challenge to existing knowledge but does not represent competing courses of action; indeed, interview quotes presented in the paper affirm that these parliamentarians are very clear about the course of action that they wish to take. The *problematization* archetype is expressed in the paper in the form of visual depictions (diagrams, figures) revealing the complicated political circumstances that a naïve view of e-democracy overlooks. The paper introduces the name for this paradox: “the middleman paradox” (p. 27).

In contrast, the *explanation* archetype emerges when authors take a *responding* approach to scholarly absurdity. The indicative example here is Gerow et al. (2014). That paper addresses the established alignment paradox (Tallon 2003), referring to the observation that efforts to align IT departments and business departments – with the intention to improve business performance – may actually constrain

business performance due to inflexibility imposed by the alignment process. This is a scholarly paradox because it represents a challenge to the previously accepted knowledge claim that IT-business alignment improves business performance. The paper addresses the alignment paradox based on a meta-analysis of 71 studies (Gerow et al. 2014). The *explanation* archetype is expressed in the paper in the form of statistical tables and a constructed research model suggesting that the concept of “alignment” can be understood in terms of different types of alignment – such as intellectual alignment, operational alignment and cross-domain alignment – and “*only the intellectual alignment–productivity relationship suggests an alignment paradox might exist in some situations*” (Gerow et al. 2014, p. 1174).

Finally, the **exaptation** archetype emerges when authors take a *reframing* approach to scholarly absurdity. The indicative example here is Pinsonneault and Rivard (1998), addressing the productivity paradox (not to be confused with the above production paradox). The productivity paradox refers to the observation that investment in IT, anticipated to increase productivity based on existing knowledge about IT investment, does not actually increase productivity (Brynjolfsson 1993). This is a scholarly paradox because it represents a contradiction and challenge to existing knowledge more so than competing courses of action. The paper addresses the productivity paradox by adapting an existing paradox, the Icarus paradox, referring to the figure from ancient Greek mythology who flew so close to the sun that his wings melted, i.e., “*his greatest asset led to his demise*” (Miller 1992, p. 24), and how organisations experience something similar when “*their victories and their strengths so often seduce them into the excesses that cause their downfall*” (Miller 1992, p. 24). In other words, the *exaptation* archetype is expressed in the paper by explaining one paradox (the productivity paradox) as the situated instantiation of another, broader paradox (the Icarus paradox).

#### 4 Analysis Round 2: How Do Narratives of Paradoxes Unfold?

In our second round of analysis – currently ongoing – we are performing an inductive analysis, performing open coding of the different patterns of narratives about paradoxes. The preliminary outcome of this analysis is detailed in the text below and depicted in Figure 1.

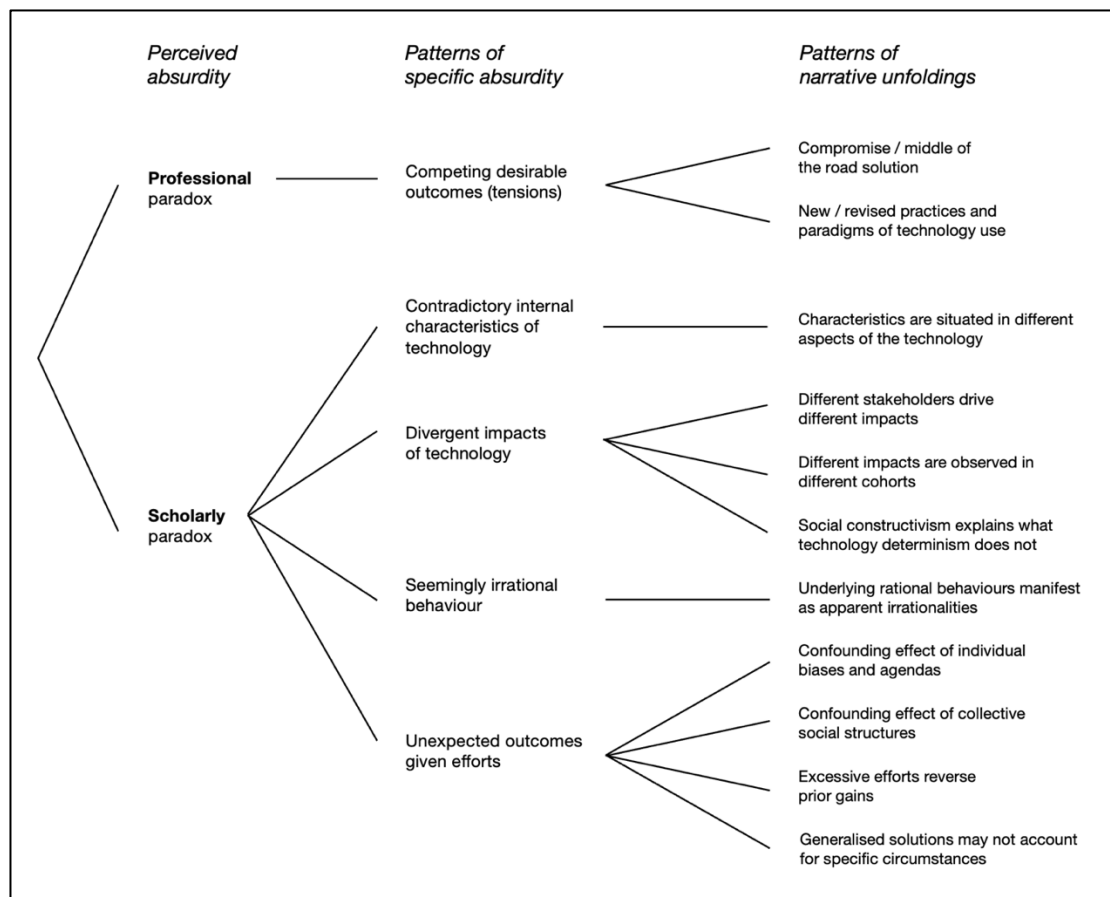


Figure 1. Preliminary patterns of how paradox narratives unfold (Analysis Round 2 / RQ2).

We retain our reliance on our own interpretation, with no input from automated text mining or algorithmic toolkits. Like the first round of analysis, we begin with the two perspectives on absurdity, distinguishing between professional paradox vs. scholarly paradox. At that point, this round of analysis deviates from the previous round in that we do not classify papers according to *a priori* existing categories, but rather, capture the patterns that we see in the papers into open codes that we generate from our interpretation of papers. These codes exist at two levels: at the first level, *patterns of specific absurdity*, referring to the specific forms in which a professional paradox or scholarly paradox is absurd; each of which may entail one or many open codes at the second level, *patterns of narrative unfoldings*, referring to the different overall directions in which the narratives about those paradoxes tend to go. The second-level codes are elaborations of the first-level codes, in a similar fashion to the data structure format proposed by (Gioia et al. 2012); however, the structure here is more specific in that the second level is not merely a roll-up aggregation of what the first level captures as drill-down details, but rather, the first and second level also describe different facets of each kind of unfolding narrative (first level: *what is absurd?* → second level: *how does the story about the absurdity unfold?*).

For *professional* paradoxes, the only pattern of specific absurdity that we have identified so far is that of *competing desirable outcomes (tensions)*. One pattern in which the narrative then unfolds is arrival at a stable equilibrium in the form of a *compromise or 'middle of the road' solution*, e.g., as Lederer and Sethi (1996) identify for the “planner’s paradox”. Another pattern in which the narrative unfolds is the formation of *new or revised practices and paradigms of technology use*, e.g., as Konsynski and Tiwana (2004) identify for the “improvisation–efficiency paradox”, and as Baillette et al. (2018) identify for “BYOD-related security paradoxes”.

Meanwhile, for *scholarly* paradoxes, there are a few more patterns of specific absurdity. One such pattern is that of *contradictory internal characteristics of technology*, for which one pattern in which the narrative then unfolds is that these *characteristics are situated in different aspects of the technology*. This is the narrative told by Quattrone and Hopper (2006) of the “heterogeneous” paradox, that “IT appears homogeneous for it attracts and generates heterogeneous uses” (p. 212). A slightly different pattern of specific absurdity is that of *divergent impacts of technology*, differentiated from the above in that these are the external impacts rather than the internal characteristics that are divergent and thus absurd or contradictory. One resulting narrative is that of divergent impacts where *different stakeholders drive different impacts* as in Jarrahi et al. (2019) on the autonomy paradox; and narratives where *different impacts are observed in different cohorts*, e.g., Pinsonneault and Kraemer (1993) on how IT both increases and decreases the number of middle managers. There are also narratives of divergent impacts where *social constructivism explains what technological determinism does not*, e.g., Mazmanian et al. (2013) on the autonomy paradox.

Scholarly paradoxes also entail patterns of specific absurdity where there is *seemingly irrational behaviour*. So far, we identify one pattern in which the narrative then unfolds, that *underlying rational behaviours manifest as apparent irrationalities*. This is the narrative told by Akhlaghpour and Lapointe (2018) of the allegedly paradoxical diffusion of the capability maturity model. A slightly different pattern of specific absurdity is that of *unexpected outcomes given efforts*. One kind of resulting narrative is that of the *confounding effect of individual biases and agendas*, e.g., Griffith et al. (1998) on paradoxes in facilitation, and Mahrer and Krimmer (2005) on the middleman paradox. Alternatively, the narrative could unfold about the *confounding effect of collective social structures*, e.g., Wu et al. (2019) on the analytics-innovation paradox. Another kind of narrative is that in which *excess efforts reverse prior gains*, e.g., Drummond (2008) on the Icarus paradox. Finally, there is the narrative that *generalised solutions may not account for specific circumstances*, e.g., Bechor et al. (2010) on the planning paradox.

## 5 Expected Contribution and Next Steps

In this paper, we report on our project to contribute a narratology framework of ‘paradox’ in IS, to help aspiring authors of paradox research in IS more clearly state the nature of their contribution. Notably, our framework differentiates between the ‘professional’ paradoxes of the management ‘paradox theory’, and ‘scholarly’ paradoxes like the productivity paradox and the personalisation-privacy paradox. The latter do not fit into ‘paradox theory’ and yet have been a hallmark of ‘paradox’ in IS. Our framework seeks to promote pluralism in paradox IS research going forward, continuing our discipline’s rich tradition of diversity as the place where the social and the technical coexist and encounter one another.

Our research project, still in-progress, is receptive to ideas and suggestions. For example, we now have two different rounds of analysis; both appear promising, but combining them would greatly increase the complexity of the framework. We hope that, by presenting our work at ACIS 2023 and inviting feedback about it, we can together work towards a narratology of paradoxes that serves our community well.



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