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Research Exchange - Sept. 13, 2021 "Advancing Research Transparency - A View from MISQ"

Andrew Burton-Jones
The University of Queensland, Australia, abj@business.uq.edu.au

Eivor Oborn
Warwick Business School, eivor.oborn@wbs.ac.uk

Balaji Padmanabhan
University of South Florida, bp@usf.edu

Wai Fong Boh
Nanyang Technological University, Singapore, awfboh@ntu.edu.sg

Rajiv Kohli
College of William & Mary, rajiv.kohli@manson.wm.edu

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EDITOR'S COMMENTS

Advancing Research Transparency at *MIS Quarterly*: A Pluralistic Approach

By: **Andrew Burton-Jones, Editor-in-Chief**
Wai Fong Boh, Senior Editor
Eivor Oborn, Senior Editor
Balaji Padmanabhan, Senior Editor

In this editorial, we discuss steps *MIS Quarterly* is taking to address research transparency. Research transparency refers to the practice of being open about how a piece of research has been undertaken and its implications. In the name of transparency, should researchers be providing an array of additional material for reviewers and future readers, such as data, materials, code, proofs, subjective value judgments, or guidelines for application? What is appropriate for this journal?

Over the last decade, research transparency has been one of the most discussed elements of the scientific process, motivated by the belief that science should be more open than it has been (Davenport et al. 2020; Monroe 2018; NAS 2018; Nosek et al. 2015; Swanson et al. 2020). Given its prominence in scientific discourse, it is important to discuss, and update, our journal's position on it.

In our experience, many researchers have strong views on this topic. Accordingly, we note a few issues at the outset.

First, we include research transparency and pluralism in the title of this editorial because the two concepts go together. We cannot talk meaningfully about research transparency without respecting research plurality, by which we mean the diversity of research approaches, methods, and genres in our field. Our goal is to advance transparency *with* plurality, and we assume that advancing research transparency with plurality is a principle all IS researchers can subscribe to. That is, rather than adopt just one subcommunity's view of transparency, we wish to support all the communities in our field and celebrate the diverse ways openness can be achieved and the benefits it can offer.

Second, our aim is to engage the field in the steps that *MIS Quarterly* takes. We need to engage the field because the science of peer review is not advanced enough to give us clear guidance (Linkov et al. 2006; Tennant and Ross-Hellauer 2020). We need to work with, learn from, and gain buy-in from all members of our field (authors, editors, reviewers) (Jacobs et al. 2021). Accordingly, rather than instituting a set of fully specified, unchanging policies, we are introducing policies that have some flexibility in application, allow lead time before they have effect, and allow adaptation over time as we learn. We also invite discussion on our policies—for example, in our annual author- and reviewer-development workshops, in author–editor exchanges on papers, and in a new FAQ page on *MIS Quarterly* website (https://misq.org/author_changes).¹ In our discussions with the community, we will not be seeking a unified consensus. Achieving transparency *with* plurality will involve supporting diverse and even divergent views.

Third, the research transparency movement is an institutional change in the field of science (NAS 2018), and we know from studies of institutional change that this process is complex (Scott et al. 2000). Irrespective of the choices we make, *MIS Quarterly* will be affected by dynamics related to this change both within our field and from outside our field, e.g., in the interfaces between science, industry, and society. Nevertheless, we still have agency and some freedom to chart our course. As we chart that course, we should recognize that this institutional change is closely related to the subject matter of our field, as many of the changes are being driven by new technology affording new possibilities for the conduct, assessment, and communication of research (NAS 2018, 2019). Of course, such IT-enabled institutional changes can have both positive and negative effects (Zuboff 1988). Recognizing that this phenomenon is something familiar to us should inspire us to take our own path forward with diligent circumspection regarding the potential effects.

¹In case the URL changes over time, the page will always be accessible from the 'Instructions for Authors' page.

Some Background

This topic can sometimes be viewed quite narrowly. For instance, transparency can be viewed in terms of providing very specific content (e.g., data) for a very specific purpose (e.g., to test the reproducibility, and thereby credibility, of a study's findings). We are taking a much more expansive view so that we can support a pluralistic approach to the issue. We use the taxonomy in Table 1, adapted from Elliot (2020), to outline the dimensions we believe are important for *MIS Quarterly*.

Why, and why now? Purpose.	<ul style="list-style-type: none"> • Promoting trustworthiness in research • Facilitating application and impact • Facilitating research pedagogy • Promoting innovation and generativity • Demonstrating accountability to society • Facilitating reanalysis and replication (in some research traditions)
Who? Audience.	<ul style="list-style-type: none"> • Authors • Editors/reviewers • Other researchers • External stakeholders
What? Content.	<ul style="list-style-type: none"> • Data, methods, code, materials, proofs, empirical descriptions • Review process • Researchers' respective contributions and interests • Researchers' interpretations, deliberations, value judgments
How? Mechanism/Venue	<ul style="list-style-type: none"> • Journal article • Journal repository/archive • Other external repositories/archives
When? Timeframe.	<ul style="list-style-type: none"> • Before/upon submission • During review process • Upon/post acceptance • Upon request • Recommend vs. require vs. enforce
Why not? Dangers.	<ul style="list-style-type: none"> • Imposing costs on researchers, journals, and readers • Harming research participants and/or research partners • Unintentionally sending the wrong signals by inappropriately increasing trust, reducing trust, or causing confusion • Facilitating efforts to harass or mislead

Readers who are familiar with this material and want to “cut to the chase” may want to move to the next section to see what steps *MIS Quarterly* is taking. We provide this background, however, because the issues are complex. It is not meaningful or sensible for a journal to try to “increase the transparency” of the research it publishes without considering what this really means, and what it could or should mean for us. We need to be transparent with you about what we have considered.

Purpose

Research transparency is a complex topic because it is a means to achieve at least six quite different purposes. Given that so much of the complexity with transparency arises because of these different (and sometimes conflicting) purposes, we briefly discuss each one.

One purpose is to increase readers' trust in the research. From this view, being transparent is being open about what you did and found. Some researchers avoid openness due to a concern that it will enable reviewers or editors to see limitations in the work and reject it. The transparency movement counters this concern by saying that all research is limited and that a high-quality review process will celebrate imperfect-but-important research; the key is to be open about it (NAS 2018, 2019). Authors and editors can follow many approaches to increase trust through openness. The challenge is that different consumers of the research may require different levels or types of information in order to trust it.

Some readers may be satisfied with authors stating the overall conclusions from a piece of analysis, others may want to see detailed results, and yet others might want to see even more details (such as raw data). Authors and editors need to find the appropriate balance.

A second purpose of seeking transparency is to facilitate future application and increase the impact of the research by clarifying how and when readers can apply it (Elliot 2020). The meaning of transparency shifts in this case from what authors did and what authors found to how to apply it (e.g., in the form of application guidelines). For instance, if a study showed that a particular IS-related intervention helped to achieve an outcome, greater transparency could involve providing more details on exactly how to implement it in practice. Once again, this purpose may seem laudable, but the difficulty is deciding what level of detail is needed for different audiences.

A third purpose of transparency can be to increase a study's pedagogical value. Researchers read articles not just to learn a study's specifics, but to learn the craft of science itself (Huck and Cormier 1996). Using this lens, transparency can involve giving readers more insight into why and how the research was conducted. Oftentimes, authors write a reconstructed story of how they gained their insights rather than what they actually did (Levina 2021), whether to fit with norms in a field, or simply for the sake of brevity (Zimmerman 1989). Greater transparency could involve recounting more of the actual journey. The question is how much, to give sufficient insights for researchers to learn from and yet remain sufficiently parsimonious and not reduce the credibility of the research.

A fourth purpose of increasing transparency is to provide material that could prove generative for other researchers, such as ideas, instruments, data, or even areas of uncertainty that could help readers see the research or the domain in new ways (Murphy et al. 2020). One way of thinking about this issue is to distinguish between the "facts" in a domain and our "fictions" (e.g., theories) about them (Van Maanen 1979). Using this lens, being more generative could involve giving more details about the facts and fictions so that other researchers can understand them and consider alternatives. After all, facts and fictions are typically not as simple as they appear. Facts may not be facts at all, and different perspectives and meanings are often possible (Fish 1978; Van Leeuwen 1981; Van Maanen 1979). As a result, being transparent can help future researchers to read a study anew and take it further (Berente et al. 2019; Moravcsik 2019). Again, the question is how much to provide in the name of generativity.

A fifth purpose is to demonstrate the responsibilities that scholars have to the societies they serve in response to the academic freedom they receive (Elman et al. 2018). Using this lens, the purpose of being transparent is not so much to provide any specific piece of content *per se*, but more to send a signal about the willingness to be open and accountable to society. This concern is not just idealistic. It is also a political and pragmatic one because society's views about science (and a government's views, as its representative) can greatly influence funding and access. These concerns have been a major factor in the transparency movement (Moravcsik 2019; Yannow 2018). This can also extend to being open when publishing the findings (e.g., the open access publication movement).

Finally, in some research genres, a key purpose is to provide all the details needed to reproduce or replicate research. This purpose has perhaps been the most controversial, because while many researchers consider reproducibility and replicability to be the *sine qua non* of science (Alter and Gonzalez 2018; Nosek et al. 2015), others reject them (Leonelli 2018). Some qualitative researchers reject reproducibility and replicability due to their incompatibility with an interpretive worldview (Monroe 2018; Pratt, Kaplan, and Whittington 2020). Some genres of quantitative research accept reproducibility but might question replicability, particularly across contexts and time (Tremblay et al. 2021). In design science, which often involves repeated cycles of design and implementation of a novel artifact in a real-world system, each intervention can change (e.g. improve, disrupt) the system in ways that significantly alter the research problem for the next cycle. Reproducibility that requires returning to the previous system state may not make sense when the goal is to evolve the environment with continual design improvements (Vom Brocke et al. 2020).

Clearly, many answers exist to the question of *why* we should seek greater research transparency. We must also consider *why now*. One reason is that institutional change is already occurring across the sciences. Thus, the time is now because we still have the ability to chart our course. Another reason is more specific to the IS field. Specifically, our research is becoming increasingly relevant and influential as digitalization affects every aspect of organizational and social life. This increasing relevance naturally increases the salience of all six purposes above. Moreover, as students of technology, we are aware how new technology is opening opportunities and challenges for transparency (NAS 2018, 2019). Compared to many other fields, therefore, one could argue we have a responsibility to provide leadership in the research transparency movement.

Audience

At least four different stakeholder groups can benefit from greater transparency. First, authors can benefit because human memory is fallible (Schacter 1999), and a more transparent paper will provide a more effective record of what they did and why. Editors and reviewers can also benefit because they can provide a more informed judgment about the quality and potential of a research paper. Other researchers can also

benefit because they have more information about a paper that they can use for whatever purpose they are interested in (per the purposes above). Finally, external stakeholders can benefit, such as practitioners, governments, and the media. Increasingly, IS research is informing business leaders and policy makers in a variety of domains. Greater transparency can help these stakeholders to understand, appreciate, and apply the research properly and within the bounds it has been shown to work in.

Content

Journals and authors need to think of the *amount* of content required to make research transparent. The right amount might depend on the potential impact of the research on practice. For instance, in a discussion about the lack of transparency surrounding a deep-learning algorithm for cancer screening, Haibe-Kains et al. (2020, p. E15) note that “for scientific efforts in which a clinical application is envisioned and human lives would be at stake ... the bar of transparency should be set even higher.”

We also need to think of *which* content in a paper needs to be made more transparent. In principle, almost any aspect of a paper can be made more transparent (Aguinis et al. 2018; Templier and Paré 2018), but it is perhaps most common to think of transparency in the context of a study's empirics, such as its data, methods, code, or materials. Even here it is challenging because different research communities can have very different understandings of basic empirical concepts. For instance, a request to include all of a paper's data in the name of transparency would be difficult for a grounded theory researcher to interpret, let alone agree to, because in that tradition *all is data* (Glaser and Strauss 1967). Another challenge is that methods continue to evolve (Xu et al. 2020). Thus, requests for content need to reflect changing expectations and understandings of methods over time.

Other elements of content can also be considered beyond the paper itself, such as the content of reviews (Kriegeskorte et al. 2012). For instance, BMJ Open and PLOS ONE allow readers to see the full review history of a paper alongside the paper. Many fields also want authors to be transparent about their contributions to articles and conflicts of interest (McNutt et al. 2018). We can also ask authors to be more transparent about the value judgments underlying their work (Elliot 2020).

Mechanisms and Venues

We can think of various mechanisms through which, or venues in which, to increase transparency. One option is to increase transparency by including additional details in a paper itself. This could involve lengthening the paper or structuring certain elements (e.g., the methods section) (Aggarwal 2018). This can become challenging because what researchers expect to see in each section of a paper can vary across a field and over time. Another option is to use various repositories, hosted by the journal or hosted externally (Austin et al. 2015; Mertens and Recker 2020; Soderberg 2018; Toelch and Ostwald 2018). This option raises additional questions, such as the reliability of the repositories, and how to decide what material should appear in the paper vis-à-vis the repository.

When reflecting on these options, it is helpful to be aware that our understandings of what a research article is, and could be, and what a review process is, and should be, are products of complex historical and social forces (Baldwin 2018; Gross et al. 2002; Hyland and Meyer-Salager 2008; Nielsen 2013). As a result, when choosing mechanisms/venues, we need to be humble about what is right/wrong, and what is possible, and be open to learning and adjustment.

Timeframes

Journals can encourage or require research transparency prior to submission, during the review process, upon acceptance of a paper, or simply at any time upon request. Likewise, journals can vary in whether they recommend, require, or enforce elements of transparency, and these can vary over time (e.g., recommending certain elements on submission and requiring them on acceptance). The timing of transparency decisions can also depend on a paper's specifics. For instance, a journal might increase its focus on transparency if a paper deals with something that is highly relevant in practice at that time (Liu et al. 2019). According to Beugelsdijk et al. (2020), most business journals currently adopt a voluntary approach, but approaches vary across other fields.

Dangers

The push for transparency can impose costs on researchers, journals, and readers, by increasing the amount and variety of material that has to be prepared, reviewed, revised, and read. Some of these costs have multiples due to multi-cycle journal review processes.

While some costs can pay off in higher-quality work (Morrison 2016; Tiokhin et al. 2021), other costs can have chilling effects on particular research communities (e.g., those with less time or funds) and topics or methods (e.g., those where it is more complex to address transparency) (Jacobs et al. 2021). The push for transparency could thereby marginalize specific types of work, ironically *reducing* rather than increasing visibility. It has often fallen to senior scholars to voice such concerns because junior scholars can feel unable to speak up (e.g., Monroe 2018; Pratt, Kaplan, and Whittington 2020).

While these costs could be felt by all research communities, we need to mention qualitative researchers in particular because, if poorly managed by the journal, some segments of this community might view these costs as prohibitive. Specifically, qualitative researchers who hold interpretive (and similar) assumptions could question the fundamental assumption with which we began this editorial. As Jacobs et al. (2021, p. 181) note, such researchers would argue that transparency (viewed narrowly) applies more naturally to research with *positivist* assumptions in which a research paper can be viewed as an attempt to “see through” the research process (and the raw data) to an independent, unmediated world, as it is. Researchers subscribing to interpretive (and similar) assumptions would reject such views entirely, arguing that the phenomena researched, the data analysis process, the categories chosen and deemed significant, as well as the written text, are all socially constructed processes of which the author is very much a part. The notion of transparency, if viewed as seeing through and into an objective world, would not make ontological sense to such researchers. If *MIS Quarterly* only adopted that position, it would impose prohibitive costs on researchers who subscribe to other logics of inquiry (Jacobs et al. 2021; Pratt, Kaplan, and Whittington 2020). We need to stress that such a meta-standard is not our position. We believe all communities can find value in transparency when they can interpret it in ways that make sense *within that community*. Nevertheless, any danger needs to be acknowledged to be addressed.

In addition to the costs imposed on researchers, the push for transparency can also impose costs on research participants and partners. For example, researchers seeking to make data transparent can unintentionally breach their research participants' confidentiality (Sweeney 2015). Clearly, such costs can then create additional costs for researchers in that our participants and partners may simply be unwilling to collaborate with us, or may impose their own hurdles that make the research infeasible. This would be another ironic and harmful effect given that many societies are desiring more collaboration between academe and industry, not less (Rai 2019; Tremblay et al. 2021).

Providing additional material to increase transparency can also impose cognitive costs, by sending the wrong signal to readers. Depending on what material is presented, how it has been reviewed, and how it is interpreted, the additional material may lead readers to place more or less trust in the paper than they should, or it may simply confuse them through the sheer mass of detail presented.

The push for transparency may also have a political edge. Increasing the amount of material available can provide readers (whether in academia, industry, government, or the media) with a larger leeway within which they can find the story they prefer to find. It can also provide them with more areas to target in their efforts to disrupt, influence, or even attack an author. This is especially true for topics in which vested interests exist (e.g., commercial, social, or political) (Fischhoff and Scheufele 2019; John 2018; Lapowsky 2021; Levy and Johns 2016; Lewandowski and Bishop 2016).

Finally, we need to be mindful of how costs can become entrenched through institutional processes. For example, the push for research reporting guidelines by the Open Science Foundation (OSF) (see Moher 2018; Nosek et al. 2015) led to a predictable rise in their endorsement (ICMJE 2019) and enforcement (Walsh et al. 2020). Badges can also be offered to papers to show compliance with these guidelines. While well-intentioned, applying these norms can have unintended effects, such as when the guidelines are not helpful or evidence-based (Buss and Perron 2020), and when they encourage unhelpful tick-box behavior (Jarzabkowski et al. 2021; Pratt, Sonenshein, and Feldman 2020). Authors may feel that this is yet one more hurdle to jump rather than a meaningful endeavor.

In addition to having unintended negative effects at the paper level of analysis, unintended negative effects could also occur at the journal level if not well-managed. For instance, the OSF's approach is leading to the emergence of new journal rankings (Grove 2020). While laudable in principle, ranking regimes do not always lead to the behaviors we expect. If we chase rankings in an uninformed way, we could easily marginalize particular research communities for the reasons outlined above.

Summary

Summing up our discussion of the dimensions of transparency, our view is that research transparency is laudable in principle, as it offers many benefits, and its importance is only likely to grow. Nevertheless, it is a challenging ideal to address, and initiatives can easily backfire if addressed poorly. Like many cases of institutional change, the challenges exist at multiple levels. We should not expect that we can address the issues simply or quickly (Butcher et al. 2020; Hardwicke et al. 2020). We need to take an approach that is mindful of the complexities involved.

Our Approach at *MIS Quarterly*

To address research transparency, we need to (1) update existing policies, (2) decide what dimensions of transparency to tackle in new policies, and (3) develop and enact the new policies. We address each of these in turn below.

Regarding existing policies, we currently have limited policies regarding research transparency. Specifically, authors must complete a Provenance Declaration (<https://misq.org/provenance-service>) to be transparent about closely-related papers or data-sets, and authors and review team members must be transparent about conflicts of interest (COI) (<https://misq.org/conflict>). Such policies will continue and we will simply update them where needed to reflect best practice.²

Regarding the dimensions to tackle, we will need new policies to address most of the dimensions in Table 1. While all the dimensions are relevant, we will defer some of them so that we can identify the right approach to take (as explained in Burton-Jones 2021). The ones we are deferring mainly relate to two issues associated with the *content* and *timing* dimensions of Table 1.

- *Transparency of reviews:* *MIS Quarterly* has previously trialed initiatives for making the review process more transparent, such as making the names of reviewers transparent, either during the review process (as used in the review of Bhattacharjee 2001) or post-publication (Saunders 2005), but other initiatives can also be tested, for example, making reviews available post-publication (Kriegeskorte et al. 2012). Because the issues are complex (Ross-Hellauer and Görögh 2019), we will defer it to a separate, dedicated initiative.
- *Transparency pre-submission:* We should also trial initiatives for making study procedures and expectations more transparent either before submission or via a multiphase submission, for example, via preregistrations and registered reports (Nosek et al. 2018; Weinhardt et al. 2019). This is another initiative that deserves a dedicated treatment.

Regarding new policies, the goal in the remainder of this editorial is to outline a set of new policies and explain how they will be enacted.³ Given the complexity of the topic, we offer a comprehensive approach that involves normative elements (to convey expectations), structural elements (to convey roles and resources), and procedural elements (to set the policy in action and to learn over time).

Normative Elements: Our New Expectations for Transparency

Our new expectations are oriented around providing clear guidance for authors, respecting a plurality of traditions, and offering flexibility to deal with the specifics of any given paper.

We seek to minimize the cost of transparency on authors by reducing requirements at the stage of initial manuscript submission and deferring requirements until a paper is on a positive trajectory toward acceptance (discussed further below). Other journals have similar norms (e.g., *Quarterly Journal of Economics*, *Management Science*, and *Journal of Personality and Social Psychology*).

Upon initial submission, we will expect authors to agree to supply transparency-related materials at later stages of review and broadly indicate what material they will provide, but we will not require authors to supply such materials up-front. We provide examples below of the types of materials we would expect for different types of research (in the section on enacting the policy). However, there can always be exceptions due to a study's specifics. To address this uncertainty, we provide general principles in this editorial as well as concrete examples. We will also allow authors and their Senior Editors to negotiate on the specifics of a given case. Overall, we will expect authors to engage in a *spirit* of transparency rather than focusing on the *letter* of any specific policy.

In creating these new norms, we need to clarify the journal's scope-of-practice. Historically, the expectation at *MIS Quarterly* has been that reviewers and editors will review (1) *manuscripts*, (2) *response documents*, and, sometimes, (3) *supplementary materials*. The supplementary materials (sometimes called "supplementary appendices" by authors and editors) could contain a wide range of material, including experimental material, survey instruments, additional statistical tests, and so on. While the role of the manuscript and the response document are relatively clear, the the supplementary materials has been problematic, in part because of the nature and volume of information provided. These

²We will update the conflict of interest policy, which currently focuses on COIs that arise due to relationships between authors and editors/reviewers so that it also covers COIs that arise due to the paper's topic (e.g., if the paper addresses a topic in which the author, editor, or reviewer has a financial interest). We will also update the provenance policy to cover provenance over data collected from public (e.g., online) sources.

³During the second half of calendar year 2021, these new policies will be updated on *MIS Quarterly*'s website in the form of revised instructions for authors, with a link back to this editorial for more context.

documents were rarely constrained by length, content, or formatting requirements, and were sometimes longer than the paper itself. Such lengthy documents imposed high costs on authors and review teams, and they raised additional complexities in post-publication (e.g., for where and how to host the material). We previously allowed authors to submit such supplementary materials and typically compiled them into the review packet that reviewers received. In an effort to reign in the ever-expanding size of papers and review packets, this practice was changed in 2020 to require authors to submit self-contained papers (including all appendices) that met newly established page limits (<https://misq.org/lengths>). One outcome of this change is that some authors and editors may now be stuck between a rock and a hard place, wanting to provide additional material for transparency, but not being able to do so. In our view, the root cause of the problem with supplementary materials was that they fulfilled an ambiguous purpose, partly providing details about a paper that was relevant for the review process, and partly providing additional detail for future readers of the paper for transparency purposes. In short, the journal's scope-of-practice regarding these materials was not clear.

Based on our experience with supplementary materials and our reading of the transparency literature, we are making a clean break between an author's *manuscript and response document* (which will be subject to peer review and have limits on length, see <https://misq.org/lengths> and <https://misq.org/revision-response>) and *transparency materials* (which will not be subject to peer review, will have no page limits, and will be provided for transparency purposes only).

While the transparency materials will not be subject to peer review, the journal will bear responsibility for two *editorial judgments* on them:

- Judgments regarding what content should, at a minimum, be included in the transparency materials *vis-à-vis* the manuscript. That is, for a given paper, what should readers expect to find in the transparency materials? Authors can always provide more materials if they wish, but the journal should have a standard for the minimum required.
- Responsibility for ensuring that the transparency materials are presented and organized in a high-quality manner (i.e., to a standard that readers of *MIS Quarterly* should expect). For instance, if the results of a statistical test are shown, the variables will be defined, the layout will be easy to follow, and readers should be able to interpret the results clearly and understand how these results relate back to a relevant element of the paper.

What if our policy of not reviewing the transparency materials leads us to publish a paper with errors? This is an acceptable risk because the goal of the transparency movement is not to produce error-free science but to make the process of science more open, errors and all. Also, if a particular set of material is central to a paper's contribution, it is the responsibility of authors and editors to bring it into the main body of the paper, where it can be peer-reviewed. As a result, errors in the transparency material should not, as a general rule, invalidate a paper's central contribution. Of course, the risk could still arise (e.g., if there is a problem in a paper's raw data). Nevertheless, there must be some limit to a journal's responsibility. Accordingly,

MIS Quarterly's scope of practice is only to review an author's submitted manuscript and response document and to ensure that appropriate transparency materials (if any) are provided in a clear and understandable way for future readers.

This responsibility will be stated in the transparency materials as well. That is, the transparency materials that accompany an accepted paper will include a clause stating that the materials are made available for the benefit of readers, that they were not subject to peer-review, and that *MIS Quarterly* bears no responsibility for their use.

Structural Elements: New Roles and Resources for Transparency

Our policy involves changes to the Editorial Board as well as to our research infrastructure.

In terms of the Editorial Board, *MIS Quarterly* uses a three-tier system of Reviewers, Associate Editors, and Senior Editors. We will complement this structure with a parallel layer of Research Transparency Editors. This new role will begin formally on January 1, 2022.

The new role of Transparency Editors will be similar in spirit to those at other journals, such as the *American Economic Review's* "Data Editor," the *Journal of Personality and Social Psychology's* "Methods and Statistics Associate Editors," and the *INFORMS Journal of Data Science's* "Reproducibility Editor." Although a number of journals have instituted this approach, there is not and need not be a uniform approach. A related approach is to add another type of reviewer role (rather than an editor role) (Hardwicke et al. 2019; Hardwicke and Goodman 2020) but we are focusing on editors at first to signal the importance of the initiative and because the role of these editors will be to make editorial judgments rather than peer-review judgments (as noted above).

In the immediate term, the addition of this new role will not lead to a change in board membership. Rather, we will source individuals for this new role from our existing list of Associate Editors and Senior Editors. That is, in addition to handling their regular duties, Associate Editors or Senior Editors may be asked to also serve as the Research Transparency Editor for a number of other papers, thereby expanding their duties. We may build a dedicated team of Research Transparency Editors over time, as we learn how the role evolves.

The Research Transparency Editors will have two roles:

- To report to the Editor-in-Chief on ways to improve research transparency with plurality at *MIS Quarterly* (e.g., improvements in our policies and practices) and to assist the Editor-in-Chief in socializing the new policies with members of the field (e.g., in responding to questions on our FAQ page and discussing the issues in conference or workshop panels).
- To assist Senior Editors in assessing the research transparency of specific papers. Senior Editors will remain the final decision-maker on paper acceptance and will help guide the Research Transparency Editor's work on a given paper.

A second structural element involves research infrastructure. Specifically, should *MIS Quarterly* host transparency materials on its website? Our policy will follow our scope-of-practice. *MIS Quarterly* will publish and host the *manuscript*, because this is what we review. *MIS Quarterly* will provide a link to additional material for transparency purposes as a value-added service, but this is not our core service or core competence. External platforms exist (and continue to improve) with a core competence in hosting transparency material (Austin et al. 2015; Trisovic et al. 2021). We request that authors post their research transparency materials on such a repository. We will not restrict authors to any particular repository, but instead advise authors and Senior Editors to agree on a suitable repository for the study. The seven cross-disciplinary repositories noted by PLOS ONE (<https://journals.plos.org/plosone/s/recommended-repositories>) are among a number of suitable choices. At a minimum, repositories must provide permanent archiving and preservation of material with persistent identifiers, so that the material can last as long as the journal paper lasts, and readers can be assured that it remains in its original form (Austin et al. 2015; Trisovic et al. 2021).

Procedural Elements: Setting the Policy in Action

We will alter the review and publication process to account for research transparency as follows:

- **Initial Submission:** Authors will need to agree upon submission of their paper in the submission system that they will abide by our transparency policies and indicate the type of transparency materials that they will provide (if applicable) at a suitable external repository in later stages of review (described further below). This declaration by the author will be indicative (non-binding) because the paper may change during the review process and the relevant transparency materials may likewise change. However, it should provide authors and editors with a fair guide in most cases.

If authors wish to voluntarily make transparency materials available upon submission (e.g., via external repositories with materials in a suitably anonymous form), they can do so by providing links to that material in the cover letter of their paper. While this material is not required and will not be subject to review, it could potentially signal to the Senior Editor the authors' commitment to transparency and facilitate conversations between the authors and Senior Editor about what transparency materials to submit if the manuscript progresses to later stages.

The Instructions for Authors and the submission system will offer categories that authors can choose from to describe the type of transparency materials they will later provide (e.g., data provided, data unavailable but data description provided, code provided, pseudocode provided, etc.), as well as offering the ability for authors to describe other approaches if not covered by these categories. Using structured categories will allow us to leverage this data in other ways. For instance, we can analyze and learn from trends in how categories are being used and we can use these categories in the post-acceptance phase to improve the searchability of articles (e.g., allowing researchers to search for papers that include data or code or any other category).⁴

- **During Review:** Given that research transparency can be facilitated by including content within a paper (not just in transparency materials), authors and Senior Editors are expected to determine the most suitable information to appear in the paper at each round of review. Any such material in the paper is subject to review. Authors should seek to advance transparency-with-plurality in their papers *within existing page limits*. The page lengths will not change to account for this purpose.

⁴This is an example of how transparency can support generativity at the field level, not just at the level of individual papers (e.g., by enhancing researchers' ability to conduct future meta-analyses or reviews).

In addition to what appears in the body of the paper, Senior Editors may request authors to provide additional information in their response document, where it is still subject to review. Nevertheless, the response document must also abide by length guidelines (<https://misq.org/revision-response>). It is not the place for a full set of transparency materials.

A paper may change in various ways during the review process. These changes may alter the suitability of the authors' declaration regarding what transparency material to provide. Authors and Senior Editors will be expected to be mindful of these changes during the review process and keep each other abreast of any major changes in expectations.

- **Between Minor Revision and Acceptance:** A minor revision decision signals that a paper is on a positive trajectory toward acceptance, with only minor issues remaining. When such a decision is granted, the Senior Editor will communicate in his/her decision letter what transparency materials the author should provide on the next round and how to provide it (e.g., on external repositories). Given the authors' declaration regarding transparency materials upon initial submission, and the aforementioned communications between the authors and Senior Editor during the review process, there should be no surprises at this stage. Authors will be expected to provide that material on the next round and to communicate with the Senior Editors regarding any issues in preparing it.

The transparency materials provided by authors will not be subject to peer review. As in prior rounds, only the manuscript and the response document are reviewed. Authors do not need to (but are welcome to) provide more transparency material than requested.

When the author resubmits the paper after being granted a minor revision, the Senior Editor will request a Research Transparency Editor to examine the transparency materials and to work with the Senior Editor and the Associate Editor to make a judgment about their appropriateness. The Senior Editor will choose a Research Transparency Editor suited to examine the type and genre of material involved and will communicate to him/her the priority areas to focus on.

The Research Transparency Editor will not examine the research transparency material for its contribution to research. Rather, she/he will only assess whether it helps advance the journal's mission of supporting transparency with plurality with the Senior Editor's guidance. That is, the material must (1) include all the information required by the Senior Editor and (2) be presented clearly and understandably, to a standard that *MIS Quarterly* readers should expect. The Research Transparency Editor will advise the Senior and Associate Editor of his/her judgment. It is expected that the three editors (Senior Editor, Associate Editor, and Research Transparency Editor) will come to a shared view of the appropriateness of the transparency material, but in the case of any disagreement, the Senior Editor's decision will be final.

It is the Senior Editor's responsibility to judge what information should appear in the transparency materials vis-à-vis the manuscript. Therefore, during this stage of the review process, it is possible that material could move between the paper and the transparency materials based on a negotiation between the author and the Senior Editor.

If improvements or additions are needed in the transparency materials, the Senior Editor will communicate the issues for the authors to address in a subsequent revision. This process will iterate until the Senior Editor accepts the material. During this process, authors are encouraged to explain any issues in providing the requested material.

A paper will only be accepted if the Senior Editor judges that (1) the manuscript makes a sufficient contribution and (2) the research transparency materials include the required information and are prepared to the required level of quality.

Like the Associate Editor, the identity of the Research Transparency Editor will remain anonymous to the author throughout the process until the paper has been accepted.

- **Upon and Post Acceptance:** When a paper is accepted, a short research transparency declaration will be added on the paper's first page to explain how transparency was addressed and where additional content is located, if any. Links to outside material will be included in the paper and cited where appropriate.

The name of the Research Transparency Editor will be included in the paper along with the Senior Editor and Associate Editor. The transparency material will include a clause to describe the purpose of the material and to indemnify *MIS Quarterly* from responsibility related to using the material (because we do not review it).

We will work with our distributors where applicable (e.g., AIS e-Library and EBSCO) to provide a way to highlight the fact that articles include additional transparency materials and to search for articles with such materials (e.g., to find articles that make available data, code, materials, or any other category of content).⁵

- **Grandfathering Provisions, Consistency of Application, and Learning:** The new instructions for authors will be available on *MIS Quarterly's* website in the second half of 2021. From that date until the end of calendar year 2021, we will encourage (but not require) authors of new submissions to follow our policy. We will also encourage Senior Editors to work with authors of any existing submissions in the review process to test this initiative. Authors at any stage of the review process can volunteer to provide transparency materials. We are eager to learn with and from our authors, and look forward to any innovations authors might offer during submissions.

In the December 2021 Editorial Board meeting, we will discuss key learnings during the trial period and update our policies accordingly in our Instructions for Authors. From January 2022, our new policies will become mandatory for new submissions. For manuscripts submitted prior to this date, the policy will remain optional.

To enable ongoing learning by authors and by us, we encourage authors to ask any of our editors or the MISQ Editorial Office (misqrevu@umn.edu) when they have questions about the policy. In addition to responding to direct questions, we will look for common themes in the questions we receive and post our responses to them on a new FAQ page (https://misq.org/author_changes) available from the "Instructions for Authors" page. This approach has proved successful in related initiatives (e.g., in the discussion forum of the Committee for Publication Ethics (COPE), <https://publicationethics.org/>). In the short term, the FAQ page may help readers who have immediate questions about the policy. In the longer term, the FAQ page will provide a helpful record of the issues our community needs clarified, how we considered them, and if/how our views change over time.

Enacting the Policy: Examples and High-Level Principles

To see how these elements come together and apply to any given paper, it is helpful to consider both concrete examples and high-level principles.

In the following sections, we provide four concrete examples. Some of these examples have been discussed extensively in other journals and in other fields, leading to cross-field norms emerging for such cases (e.g., <https://pubsonline.informs.org/page/mnsc/datapolicy>). We expect editors and authors to be aware of these emerging norms but to tailor the requirements to a paper's specific context. Other examples we provide have been discussed less often elsewhere (e.g., interpretive qualitative field studies). In all cases, while the minimum requirements for a given paper will be determined by the Senior Editor, authors can voluntarily submit additional information at any stage.

Example 1: Quantitative Lab Experiments

Experimental Setting, Procedures, and Materials:

- ***Content to be provided in the manuscript:*** Sufficient description of the experiment to enable readers to understand how it tests the study's hypotheses and controls for confounds.
- ***Content to be provided in transparency materials:*** Sufficient description of the experiment to allow, at least in principle, a literal replication. Institutional (Ethical) Review Board approval number for human subjects research.

Data:

- ***Content to be provided in the manuscript:*** Descriptive statistics to enable readers to understand the nature of the data obtained.
- ***Content to be provided in transparency materials:*** The data file used to conduct the main tests reported in the paper with meta-data describing the fields, or a reason for not providing the data. When data is not provided, authors could provide alternatives (e.g., worked examples or simulated data).

⁵In addition to using our own transparency tags, we could go further and offer promotional badges associated with initiatives outside our field, such as badges offered by the Open Science Foundation. As noted earlier, our concern with this approach is that understandings of transparency across the sciences may not support every research tradition in our field. Deferring these issues will give us time to consider the issues in more depth.

Data Analytic Methods:

- ***Content to be provided in the manuscript:*** Sufficient description of the data analytic methods to allow readers to learn how the validity and reliability of measures and manipulations were tested and how hypotheses were tested.
- ***Content to be provided in transparency materials:*** Sufficient description of the data analytic methods to allow researchers to reproduce the data analysis in the paper.

Example 2: Quantitative Observational Studies Using Secondary (Archival) Data or Surveys**Data Collection:**

- ***Content to be provided in the manuscript:*** For secondary/archival data: Sufficient description of the data source and the validity and reliability of the data extracted from it to enable readers to understand how it supports the paper's objectives. For survey data: Sufficient description of the population (if known), sample, survey questions, and the survey distribution procedure, to enable readers to understand how the data supports the paper's objectives.
- ***Content to be provided in transparency materials:*** For secondary/archival data: Sufficient description of the data source and the data extraction process to enable researchers, where possible (e.g., where not constrained by non-disclosure agreements) to access the data source and reproduce the data collection. For survey data: Extended descriptions of the data collection procedures and instruments to enable researchers, at least in principle, to replicate the survey. The survey instrument (in English and in the original language used). Institutional (Ethical) Review Board approval number for research involving human subjects.

Data:

- ***Content to be provided in the manuscript:*** Descriptive statistics to enable readers to understand the nature of the data obtained from the archival sources or from the survey.
- ***Content to be provided in transparency materials:*** Data sets used for the final models plus descriptions of important intermediate data sets. If data is proprietary or difficult to share, information can be provided regarding its nature and credibility rather than providing the data itself. If non-disclosure agreements or contracts prevent disclosure or description of any data, these clauses can be provided so that readers are aware of the restrictions. To the extent possible, authors can also provide examples of the type of data used and how the analytic methods were applied. If data is created by extracting variables and observations from another data source, authors can provide a software command file specifying the selection of variables and extractions of relevant observations.

Data Analysis:

- ***Content to be provided in the manuscript:*** Sufficient description of the data analytic methods to allow readers to judge the validity and reliability of the measures and the degree of support for inferences being drawn from the data.
- ***Content to be provided in transparency materials:*** Procedures and/or code sufficient to permit replication. This should cover data preparation and transformations prior to analysis, including how missing values are managed; the main statistical tests in the paper and key statistical output files; and additional tests as requested by the Senior Editor. In any code provided, comment statements should be included to explain key software commands.

Example 3: Design Science Studies Using a Computational Genre**Design Artifact and Analysis:**

- ***Content to be provided in the manuscript:*** Sufficient description of the algorithms, models, assumptions, data (along with transformation pipelines), and implementations to enable researchers to understand the methodological advance being proposed and the implications of applying and evaluating the new artifacts to the study's research question.
- ***Content to be provided in transparency materials:*** Extended details of the system artifacts, algorithms, models, assumptions, or data to enable reproduction, for example:
 - A working prototype and/or a detailed architecture.
 - Exact specification of parameters in all the algorithms that can enable researchers to reproduce the code and run it on similar data, or in a scenario similar to the one outlined in the paper.

- Data used in the study (to the extent possible), or a simulated version of the data that looks identical in structure but may be randomized.
- Code, or code fragments, that enable researchers working in the area to understand what was done in a manner detailed enough for them to implement it. If exact code cannot be provided, pseudocode may be provided.
- Executable code in a virtual containerized infrastructure such as CodeOcean that enables researchers to run the code and examine the results under different scenarios. Authors may be asked to sign a release form to release *MIS Quarterly* from liability resulting from the use of code (as used elsewhere, e.g., <https://www.jmlr.org/author-info.html>).

Example 4: Qualitative Interpretive Field Studies

Ontological Assumptions:

- **Content to be provided in the manuscript:** Descriptions of the methods and their coherence with the ontological assumptions underpinning the research.
- **Content to be provided in transparency materials:** Extended discussion of the study's philosophical assumptions to enable readers to understand the implications of the chosen assumptions, provoking re-examination of reader's assumptions.

Research Design and Data Collection:

- **Content to be provided in the manuscript:** Researchers' choices of empirical context, research design, data collection and sampling, analysis, and presentation of findings. The role of theory in research design and data collection. How closely the researchers engaged with the social setting and signaling how well they understood the stakeholders' perspectives.
- **Content to be provided in transparency materials:** Further details of research design or approach. For example,
 - Rationale for the use of partial data. This can be helpful in contexts where a paper is part of a larger field study, with only segments of the data being used for this paper.
 - Interview templates, and how the questions changed over time during the study.
 - Extended descriptions of the case to show authenticity and to help readers to understand the nature of the data (e.g., where deep knowledge of the context is needed to understand the research design choices or the nature of the data obtained).

Transparency of Relationships:

- **Content to be provided in the manuscript:** Researchers can describe how they accounted for the study's context and provide details of field worker positionality in the field and critical reflections on how the relationships between researchers and field participants and IS artifacts construct and shape the data.
- **Content to be provided in transparency materials:** Extended discussion of researcher subjectivity, biases, and ethical challenges including risks to human participants.

Tracing the Analytic Process:

- **Content to be provided in the manuscript:** The key analytic moves in the process of discovery (not blind adoption of a boilerplate template). If a process design is part of the field study, has explicit attention been given to temporal dimensions? Has the role of theory in shaping the analytic process been articulated, if any?
- **Content to be provided in transparency materials:** Extended insight into the interpretations and analysis process, such as legitimating atypical situations or contestable assertions, and providing worked examples of data coding.

High-Level Principles

A disadvantage of concrete examples is that we cannot provide examples for every category of IS research. We have clearly missed many important categories, such as meta-analyses, structured literature reviews, formal methods, amongst others. The examples we provided are also just partial. We covered laboratory experiments but not field experiments (Karahanna et al. 2018), design science research in the computational genre but not other genres (Rai 2017), qualitative interpretive field studies but not other types of qualitative research, and so on.

For instance, if we pick design science research, researchers face many decisions when they instantiate a design principle in an artifact (e.g., to build functioning software). Guidelines for addressing such issues have been proposed (Gregor et al. 2020; Lukyanenko and Parsons 2020), but we did not have the space to cover them in our examples. Similar complexities exist with the other examples we provided.

Even if an author's paper matches one of the genres covered in our examples, our examples may still prove insufficient because a requirement that we described might not apply well to that study, or other criteria might apply, simply because of the particulars of that study.

By providing high-level principles in addition to concrete examples, we hope authors and editors will understand what *MIS Quarterly* expects in any given context. We hope these principles can support a spirit or culture of transparency that transcends any specific example. In particular, we recommend that authors and editors attend to the following high-level principles in their efforts to improve research transparency in any given case.

- **Improving standards while continually learning:** This initiative is designed to improve research transparency *above and beyond* existing standards at *MIS Quarterly*. As a result, we encourage authors and editors to be *proactive* in looking for ways to improve transparency and we will nudge you to find ways to increase transparency too. At the same time, the policies in this editorial are expected to evolve as we work with and learn from our authors and the experiences of other journals. Through author–editor interactions on individual papers, editorial board meetings, author- and reviewer-development workshops, and through questions-and-answers on our new FAQ page, we will demonstrate our desire to listen to and learn with you.
- **Balancing community norms with context dependency:** Research standards are best judged by the research communities engaged in that work. Through the editorial/review process, authors and Senior Editors should discuss the particulars of any given paper as well as the general community standards that could apply to that case. A good place for authors and editors to start when considering how transparency should apply to a given study is to consider which of the six purposes in Table 1 are most relevant in the case of that paper. *It is very unlikely that all six can be accounted for fully.* Instead, editors and authors should work together to address the purpose(s) most relevant and should clarify that choice in the paper so that readers are aware of it.
- **Do no harm:** If efforts to improve research transparency are viewed as a cost of doing research, the costs must be worth the effort and should not create dysfunctional side effects (per the *dangers* in Table 1). Dysfunctional side effects for authors could include encouraging them to pursue forms of research that make it easier to comply with transparency expectations. Dysfunctional side effects for external stakeholders could include breaches of privacy. Dysfunctional side effects for editors could be to dramatically increase the amount of work it takes to edit a paper. Senior Editors and authors must be very cognizant of potential dysfunctions and work to improve transparency without doing harm. While the new policies will add costs, we seek a positive return. The goal is to raise the bar and benefits for all.

Over time, we expect that the community will learn as exemplar papers are published that include transparency material in highly effective and efficient (low-cost) ways. We will highlight exemplar papers and approaches in our author- and reviewer-development workshops and on our FAQ page on *MIS Quarterly*'s website. Initiatives for improving transparency will also be a dimension considered in the selection process of our annual best paper award (Burton-Jones 2021).

Conclusion and the Road Ahead

We are excited about this initiative and hope the IS community will be excited by it too, and feel that the time is right. Many IS researchers are well aware of the research transparency movement and have creative ideas about how to engage in it. We have so many talented authors we can learn from. We are committed to making a change but we are equally committed to learning with you and reporting back to the field to ensure that we support our journal and field as well as possible.

As we look ahead, we see two possible roads we might take. One road would lead in the opposite direction to what we want, leading to a policing culture that simply adds more costs and uncertainties onto authors and more error-checking by editors and future readers. That road would be inconsistent with *MIS Quarterly*'s virtuous reviewing philosophy and the goals of the transparency movement.

Instead, the road we wish to take is one that champions a culture of openness, appreciates the limits of science, respects a plurality of methods, and celebrates imperfect-but-important research. This road requires us to have a sophisticated conception of transparency and its multiple purposes and approaches. The road we are taking will be a long road and we will learn a lot. We look forward to working with you on the initiative, learning together, and helping our field advance.

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