

An Identification and Evaluation of Information Security and Assurance Research Outlets

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ABSTRACT: *The purpose of this study is to identify and comparatively assess the quality of information security specific publishing venues. Past studies in information systems and computer science have shown that information security-focused research can be published in mainstream information systems- and computer science-centric periodicals; however no studies to date have been found that specifically compared venues focused primarily on information security. Therefore the results of this study, when combined with assessments of publishing venues from those disciplines, can provide a more comprehensive perspective on publishing opportunities for academic authors in information security. Faculty members seeking research recognition should strive to publish in these venues and have them recognized within their respective departments, colleges and/or universities in order further establish information security as a discipline and to promote the value of information security-specific publishing venues.*

Keywords: Journal Ranking, Information Security, Information Assurance, Research Publications

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1. Introduction

Research expectations of faculty at public universities and colleges, while differing somewhat from institution to institution, are generally understood by those within that discipline to indicate a requirement to conduct research based on, and publish in, journals that are recognized as being of high quality. The challenge arises when it is needful to demonstrate the quality of a publication as a resource or publishing venue. This can be particularly challenging as a new discipline emerges, since the quality of the publication must be demonstrated to those outside the discipline, as well as to those with singular viewpoints within the emerging discipline and also those who work within the established, parent discipline. The lack of a clearly defined journal quality list in information security is a roadblock to the publication goals of faculty members and graduate students globally seeking to research and publish in this nascent discipline. A means to identify the relative quality of scholarly publications needs to be identified. Toward that end, this study builds on the methodologies used earlier in the information systems discipline to offers such a means.

Such is the case with the emergence of information security as a new discipline. Information security (InfoSec), information assurance(IA) or cyber security as it is called within the government sector, combines aspects of information systems (IS), computer science (CS), criminal justice (CJ), law and ethics, management and accounting (auditing), as well as psychology;

among others. As information security grows as a career choice, there is a corresponding increase in institutional support for higher education in the area, as is evidenced by the increasing numbers of institutions recognized by National Centers of Academic Excellence in Information Assurance Education (NCAE/IAE) program promoted jointly by the Department of Homeland Security (DHS) and the National Security Agency (NSA). DHS and NSA work cooperatively to fill a widely perceived need for increased numbers of information security professionals in both the public and private sectors, and have been mandated to support the development of InfoSec professionals by supporting public education efforts.

Faculty teaching and researching in these and other institutions with information security coursework and programs are faced with the daunting challenge of validating the quality of their research to their merit, tenure, and promotion reviewers. While many studies have examined the quality of top IS publications (as discussed later), to date, no studies have examined similar status solely from information security-focused journal venues. Therefore, the purpose of this study is to identify and prioritize quality information security-specific venues for 1) faculty publication and review for recognition events such as merit, tenure and promotion decisions, 2) to better understand the information security-specific opportunities for faculty members, in order to complement already documented studies in foundational fields such as information systems, computer science and business and 3) provide a ranked list to facilitate advanced studies by faculty and students interested in using quality information security publications as support for research and learning.

2. Related Studies and Research

Within the topic of information security, the literature shows subordinate areas of emphasis such as cryptography, network security, systems administration and managerial aspects of information security, as well as security in software development and programming. As a result, the supporting literature [1] [25] tends to address one aspect or another of information security as an emerging discipline. This mirrors research that has equated security as being a technical, socio-philosophical [22], and/or a socio-organizational [6]. Such demarcation has possibly led to a situation where security is widely regarded as a field that lacks comprehensive research in IS [13] [31]. Information security is an emerging field in IS and CS education. Although the concept was introduced as far back as 1975 [23], it has been a continuing theme throughout the 1980s and 1990s [2] [8] [11] [17].

The importance of journals in a discipline leads to the question of relative journal quality. The question of what efforts document excellence in IS research for promotion and tenure usually has a single answer, research publications [5]. This is especially true in institutions that are accredited by the Association to Advance Collegiate Schools of Business (AACSB) International [3]. Due to the emphasis on journal publication as a key metric in researcher performance, numerous studies have ranked a variety of journals, some of which not solely devoted to IS [32]. [21] argued that these studies differed in ways such as size and composition of respondent samples, number of journals included, and methods used for including and ranking journals. Furthermore, the journal ranking studies only looked at a rank at one point in time. Therefore, to address this variability, Rainer and Miller presented a method that averaged journal rankings across studies and applied that method to nine studies from 1999-2003, which resulted in a composite ranking of the top 50 journals across these studies. Overall the 50 ranked journals reflected the rich diversity of the journals in which management information systems (MIS) scholars routinely publish.

Several studies have used respondent perceptions to ascertain journal quality. [29] rated 80 publications through a mailed survey. 432 institutions were invited to participate in the survey, with 184 responding. [15] executed a global scientometric survey of IS journal rankings that targeted 8741 faculty from 414 IS departments worldwide, and resulted in 2559 responses. Also, rather than using predetermined journal lists, Lowry et al. required participants to freely recall their top-four research journals. The primary focus of the study was on top-tier journals, although the authors added top journals for reference disciplines, top read journals, and top practitioner journals. [16] and [20] used online surveys that resulted in a large sample size, as well as a high representation of journals. Some studies have used citation analysis to rank journals [10] [11] [12]. Citation analysis is purported to be a more objective method compared to respondent perceptions [21]. [12] took citation analysis a step further by controlling the number of years each journal had been in publication. However, regardless of the methods used, all studies consistently ranked journals such as MIS Quarterly (MISQ), Information Systems Research (ISR), and Journal of Management Information Systems (JMIS) highly. [16] ranked Communications of the ACM (CACM) at the top along with MISQ and ISR. These studies focused exclusively on ranking traditional IS journals. At the time that the last of those studies was published, it could well have been argued that information security was not a separately identified discipline, but was a sub-discipline of IS. At present, it may be arguable that information security is an independent academic discipline. However, as organizations of all types continue to grapple with security losses, along with the torrent of media reports about ongoing information security threats and breaches, the information security field continues to emerge as a discrete area of professional

practice and perhaps, an independent area of academic study. Therefore, to facilitate high quality research it is necessary to rank information security specific publication outlets, which to the best of our knowledge is completely lacking.

The predominant method of ranking journals has faced some criticisms. It has been argued that even though a small number of journals consistently appear at the top of most lists, it is apparent that requirements to publish only in those journals is constrained by the number of publication opportunities they offer [14] [24] [26]. This in turn affects promotion and tenure decisions for IS staff [4] [5]. This scenario is problematic for academic institutions that seek to provide broad coverage of the study of IS, including innovative and even avant-garde high quality research [30].

3. Survey Methodology

This study followed the same methodology used in [29] in structuring the survey and collecting and analyzing the data. Since there are substantially fewer InfoSec faculty members actively conducting research, than IS faculty members, it was expected that the population and thus the responding sample would be smaller.

The project began with the identification of all publications catering primarily to InfoSec subjects. While most IS-, CS-, and IT-focused journals accept papers on information security and information assurance related topics; the purpose of this study was to identify publishing venues that are primarily focused on InfoSec. The initial criteria used in identifying candidate publishing venues for the survey was that they accept external articles and were true periodicals (not one-time publications), and had been in existence for at least two years, to permit dissemination and evaluation of publications. Issues of peer review and quality of venue were intentionally left for evaluation much later in the study. Searches of publishing databases (e.g. ProQuest, ABI Inform, ACM and IEEE digital libraries) and general Web searches (using Security Journal, Security Magazine search terms) resulted in an initial list of 46 periodicals. A subsequent review eliminated five as either no longer accepting external submissions - either due to the discontinuation of the journal, or a change in editorial intent. The final 41 journals were organized alphabetically with their host URL.

3.1 Survey Content

As was performed in the [29] study, we developed an online survey using a Web-based service. Demographic questions were developed, including the respondent's institution based on Carnegie Mellon Basic Classifications, academic rank, and respondent's information security professional instructional status.

The survey then listed the candidate periodicals and asked the respondent to indicate "*your perceived quality of the journal as an academic publishing venue*" providing a Likert-type scale of "*Very High*" to "*Very Low*" with a "*N/A*" option. An "*other*" option was provided in case the respondents were familiar with a journal the researchers did not discover.

Next respondents were presented with the candidate periodical list and to identify "*the top 10 journals based on your perceived quality of the journal as an academic publishing venue from 1 (best) to 10 (10th best)*" providing a mutually-exclusive scale corresponding to the instructions. Again, the "*other*" option was provided.

The final survey was created using an online survey administration site allowing the generation of a URL invitation. In the instructions, a link to a PDF document including the candidate journals and their Web addresses were provided to allow the respondent to reinforce their perceptions.

3.2 Survey Administration

Once the survey was complete, it was submitted for review by the host institution's research review board. Upon approval, a pilot test was conducted of 5 experienced researchers in information security. Based on their comments, two additional journals were excluded from the list, one due to a renaming of the publication resulting in a duplicate entry, and the other due to publication discontinuation. Additionally, some recommendations for minor modifications to the instructions were adopted.

Next, an electronic invitation for the final survey was emailed to several lists including the host institution's annual information security conference attendee list, Purdue University's information security research email list, the National Security Agency's list of Centers of Academic Excellence in Information Assurance Education (CAE/IAE), and the AISWorld list server. A follow-up email was sent one month later.

4. Results

Including the 5 pilot testers, a total of 139 respondents completed the survey. Respondents' institutions were classified as shown in Table 1 (zero responses were omitted).

Answer Option	Response Percent
4-Year/Undergraduate/ Baccalaureate College/University	12.6%
Master's College/University	21.6%
Doctoral College/University	32.4%
Research University	29.7%
Special/Other	3.6%
Note: options based on Carnegie Mellon Basic Classification	

Table 1. Institution Type

Over 86.4% of the respondents indicated they were in a position with research responsibilities.

4.1 Value of Publication Venue

Publications are the cornerstone of many institution's promotion and tenure decisions, and a significant component of their annual merit decision making processes. As such the perceived value of the journals in which they publish becomes a substantial component of the faculty member's portfolio, as well as providing the foundation for quality research as reference material. Some institutions that specify restrictions on the journals for which publication by faculty members are rewarded create or adopt some method of providing a relative value on the journal's worth, whether it be by ranking, categorizing or otherwise comparing. When asked "Does your department rank and/or rate journal publications?" respondents answered as shown in Table 2. The "please specify" and "other" responses included "cannot be a pay to publish [journal]", and "Only refereed, and from an ABC list".

Answer Option	Response Percent
Yes, a ranking of A, B, and C tiers of journal based on quality.	50.0%
Yes, a distinction between "refereed" and "editorial" reviews.	10.6%
Yes, some combination of the above (please specify)	13.5%
No, we do not distinguish between categories of publications.	22.1%
Other	3.8%

Table 2. Journal Ranking

4.2 Journal Ratings and Rankings

Following the methodology used in multiple journal rankings [7] [10] [16] [18] [20] [27] and modified as per Whitman (2003), the primary data consisting of the journal lists was evaluated using two different methods, with the methods combined for the final table. In these examples most journals are evaluated based on one of two methods, either an independent assessment of value (rating) such as a scale of excellent to poor, or an assessment of relative worth (ranking) where respondents are asked to rank journals against one another, from best to worst. Each method has its own advantages and disadvantages. Ratings can result in multiple journals with similar values, with little granularity, and rankings can become onerous when journal lists are long. As a result, based on the recommendations of [28] a combination of ratings and a modified set of rankings (selecting only the top 5) was used. This improves upon the weaknesses of either method and results in an improved level of granularity.

For this study, the first method of periodical publishing venues employed, termed "Rating", evaluated each candidate on a 5 point Likert-type scale of "Very High" to "Very Low". These values were coded with "Very High" assigned a value of "5" down

Publication	Weighted Sum	N	Avg	Std	Var
ACM Transactions on Information and Systems Security	258	61	4.23	0.86	0.75
IEEE Security & Privacy	255	65	3.92	1.08	1.17
IEEE Transactions on Information Forensics and Security	250	61	4.10	0.94	0.89
IEEE Transactions on Dependable and Secure Computing	247	58	4.26	0.93	0.86
Computers & Security	224	59	3.80	1.10	1.20
Journal of Information Security Research	205	56	3.66	1.02	1.17
Information Management & Computer Security	180	53	3.40	0.99	0.97
Journal of Computer Security	170	51	3.33	1.05	1.11
Information Security Journal	168	50	3.36	1.10	1.21
International Journal of Information Security	166	52	3.19	1.17	1.37
Journal of Information Privacy & Security	157	47	3.34	0.94	0.88
International Journal of Information Security and Privacy	151	49	3.08	1.13	1.28
International Journal of Information and Computer Security	144	45	3.20	1.20	1.44
Journal of Digital Forensics Practice	141	46	3.07	1.18	1.40
International Journal of Computer Science and Network Security	138	45	3.07	1.19	1.43
Journal of Digital Forensics, Security and Law	137	44	3.11	1.13	1.27
Computer Fraud & Security	135	46	2.93	1.02	1.04
Journal of Security Administration	133	43	3.09	1.02	1.04
Computer Law & Security Review	131	43	3.05	1.05	1.09
International Journal of Communication Networks and Information Security	130	42	3.10	1.12	1.26
International Journal of Technology Policy and Management	121	41	2.95	1.22	1.50
ISACA Journal	120	47	2.55	1.16	1.34
Digital Investigation	112	40	2.80	1.26	1.60
IET Information Security	112	35	3.20	1.13	1.28
Information Security Magazine	107	47	2.28	1.23	1.51
Infosecurity Magazine	99	46	2.15	1.11	1.24
Information Security Technical Report	91	37	2.46	1.12	1.26
Disaster Recovery Journal	91	35	2.60	1.14	1.31
ISSA Today	89	42	2.12	1.09	1.18
Access Controls & Security Systems Solutions	87	35	2.49	1.20	1.43
Disaster Prevention and Management	84	34	2.47	1.26	1.59
Security Journal	81	42	1.93	0.92	0.85
CSO Magazine	80	36	2.22	1.12	1.26
Security Management	78	33	2.36	1.19	1.43
IATAC IAnewsletter	74	33	2.24	1.35	1.81
SC Magazine	71	37	1.92	1.12	1.24
(IN)SECURE Magazine	62	32	1.94	0.98	0.96
Security Technology Executive	54	27	2.00	1.14	1.31
Library and Archival Security	49	20	2.45	1.15	1.31

Table 3. Information Security Journal Ratings

Publication	Sum	N	Avg	Std	Var
IEEE Security & Privacy	306	39	3.15	2.35	5.52
IEEE Transactions on Dependable and Secure Computing	281	35	2.97	2.68	7.18
ACM Transactions on Information and Systems Security	269	33	2.85	2.33	5.42
Computers & Security	211	26	2.88	2.58	6.66
IEEE Transactions on Information Forensics and Security	201	30	4.3	2.74	7.49
Journal of Computer Security	137	22	4.77	2.81	7.92
International Journal of Information Security	131	21	4.76	2.47	6.1
International Journal of Information Security and Privacy	110	19	5.21	3.15	9.94
International Journal of Information and Computer Security	100	17	5.12	2.39	5.7
Information Management & Computer Security	93	15	4.8	2.77	7.67
Information Security Journal	79	14	5.36	2.99	8.92
Journal of Information System Security	74	15	6.07	3.42	11.67
Computer Fraud & Security	71	12	5.08	2.77	7.7
Journal of Information Privacy & Security	70	15	6.33	2.2	4.84
Journal of Digital Forensics, Security and Law	63	10	4.7	2.21	4.89
Journal of Digital Forensics Practice	60	11	5.55	2.25	5.07
Journal of Security Administration	53	10	5.7	3.11	9.67
IET Information Security	52	8	4.5	1.94	3.78
Access Controls & Security Systems Solutions	50	7	3.86	2.19	4.81
Computer Law & Security Review	50	9	5.44	3.39	11.47
International Journal of Computer Science and Network Security	47	10	6.3	2.68	7.17
International Journal of Communication Networks and Information Security	45	8	5.38	3.21	10.33
International Journal of Technology Policy and Management	45	9	6	2.91	8.46
Digital Investigation	41	6	4.17	2.5	6.23
ISACA Journal	38	6	4.67	0.71	0.5
Infosecurity Magazine	36	5	3.8	1.41	2
Information Security Technical Report	35	5	4.8	2.92	8.55
Disaster Prevention and Management	26	4	4.5	1.26	1.58
ISSA Today	22	4	5.5	3	9
(IN)SECURE Magazine	19	3	4.67	2.12	4.5
Information Security Magazine	19	3	6.33	3.06	9.34
Security Management	19	4	6.25	2.52	6.33
CSO Magazine	18	2	2	1.41	2

Disaster Recovery Journal	17	2	2.5	2.64	6.97
IATAC IANewsletter	12	2	5	1.41	2
Security Technology Executive	9	2	6.5	2.12	4.5
Library and Archival Security	7	2	7.5	0.71	0.5
Security Journal	7	2	7.5	3.51	12.33
SC Magazine	6	2	8	2.93	8.57

Table 4. InfoSec Journal Rankings

to “*Very Low*” assigned a value of “1”. Respondents were given the option to select “*N/A*” if they chose not to rate a particular journal. The resulting values were then summed for each periodical, providing a weighted value compensating for the variance in numbers of respondents. The results are presented in Table 3, sorted in decreasing order (highest to lowest) by the weighted sum. *N* values, averages, standard deviations and variance are also presented. As was expected, the more well-known journals did better overall. The weighted sum was used for the final combined score incorporating both the rating and ranking.

For the second assessment method, termed “*Rankings*”, respondents were asked to identify and rank the top 10 journals in their opinion. Respondents were only allowed to select one journal for each ranking from 1 (best) to 10 (10th best). The remaining 29 journals were classified as unranked. The responses were coded, assigning a value of 10 for a first place vote, 1 for a 10th place vote, and 0 for no vote, again summing the results, and sorting based on the sums, as shown in Table 4. Since each respondent was restricted to only 10 selections from the list of 39, a small *N* per item was expected. The Sum was again the weighted aggregate of all votes per venue, and was used to tabulate the final journal assessment. The Average column provides the average ranking based on the 1 = 1st place to 10 = 10th place, divided by the *N*.

The next table, Table 5, provides a combined comparison of the sums of the Ratings and Rankings assessments allowing a balanced approach to venue assessment, similar to the method performed in [28]. By combining the rating and ranking scores, a more robust score was produced. Also provided in Table 5 is the submission review method used by that venue for those institutions that distinguish between refereed and editorially-reviewed periodicals.

5. Discussion and Limitations

Based on these findings, it appears that the IEEE and ACM venues were clearly identified by respondents as the best in the field from among the listed Information Security publications. These findings are similar in nature to virtually all other IS journal publications, ranking IEEE and ACM publications in the top third of all technology oriented venues.

As was indicated earlier, the largest limitation of the study is in the number of respondents. While ideally the study would have received at least 30 responses for each assessment, due to the generally estimated small number of InfoSec faculty members actively researching in the country at this time, coupled with the relatively small number of information security specific publishing venues (39 in this study compared to the 150+ in other, IS-wide studies), leads us to believe that as the discipline continues to establish itself, subsequent studies will have higher response rates and more generalizable results. A supporting research project to this study found that in a random sample of 30 CAE institutions, only an estimated 26.1 percent of the affiliated departments’ faculty members were listed as information security faculty members. This number is projected to be higher than average for most institutions due to the formal declaration and recognition of the institution as a Center of Academic Excellence in Information Assurance Education. As the number of recognized institutions grows, it is expected that the number of faculty members publishing on information security topics and in information security periodicals will likewise increase. While the NSA recognized programs do not represent all institutions with InfoSec programs and faculty members, they are the most recognizable and largest group of information security programs in the country.

Another potential limitation of this study is that some of the publication outlets listed may not be traditional academic outlets that would be appreciated by research-oriented departments. Also, it can be argued that the list itself is not comprehensive since some of the more popular and well known InfoSec avenues are conferences (e.g. the Oakland conference). We contend that a journal list in any institution needs to be evolving one, and the one presented in this study is by no means an absolute one.

Publication	Rating Value	Ranking Value	Combined Rating & Ranking Values	Submission Review Method
IEEE Security & Privacy	255	306	561	Refereed
IEEE Transactions on Dependable and Secure Computing	247	281	528	Refereed
ACM Transactions on Information and Systems Security	258	269	527	Refereed
IEEE Transactions on Information Forensics and Security	250	201	451	Refereed
Computers & Security	224	211	435	Refereed
Journal of Computer Security	170	137	307	Refereed
International Journal of Information Security	166	131	297	Refereed
Information Management & Computer Security	180	93	273	Refereed
International Journal of Information Security and Privacy	151	110	261	Refereed
Information Security Journal	168	79	247	Refereed
International Journal of Information and Computer Security	144	100	244	Refereed*
Journal of Information Privacy & Security	157	70	227	Refereed
Computer Fraud & Security	135	71	206	Refereed
Journal of Information System Security	129	74	203	Refereed
Journal of Digital Forensics Practice	141	60	201	Refereed
Journal of Digital Forensics, Security and Law	137	63	200	Refereed*
Journal of Security Administration	133	53	186	Refereed
International Journal of Computer Science and Network Security	138	47	185	Refereed
Computer Law & Security Review	131	50	181	Refereed
International Journal of Communication Networks and Information Security	130	45	175	Refereed
International Journal of Technology Policy and Management	121	45	166	Editorial
IET Information Security	112	52	164	Editorial
ISACA Journal	120	38	158	Refereed
Digital Investigation	112	41	153	Refereed
Information Security Magazine	107	36	143	Refereed
Access Controls & Security Systems Solutions	87	50	137	Refereed
Information Security Technical Report	91	35	126	Refereed
Infosecurity Magazine	99	19	118	Editorial
ISSA Today	89	22	111	Editorial*
Disaster Prevention and Management	84	26	110	Editorial
Disaster Recovery Journal	91	17	108	Editorial
CSO Magazine	80	18	98	Editorial
Security Management	78	19	97	Refereed
Security Journal	81	7	88	Editorial
IATAC IAnewsletter	74	12	86	Editorial
(IN)SECURE Magazine	62	19	81	Editorial
SC Magazine	71	6	77	Editorial
Security Technology Executive	54	9	63	Editorial
Library and Archival Security	49	7	56	Refereed

*reviewed by a board of peers and/or editors

Table 5: Combined InfoSec Journal Assessment with Submission Review Method

Journals may be discontinued, revived, or introduced over time due to a variety of factors, e.g. emergence of new sub-disciplines etc. For example, the time specification in the crafting of the initial journal list eliminated newer journals like the Journal of Information Systems Research (JISR). While at the time the list was initially established JISR had only been in existence for 18 months, a post-survey evaluation by the panel of experts predicts it would have most likely been ranked in the top 10 journals, based on the quality of articles it publishes. Thus faculty must constantly review and compare new journals to insert them into this list and maintain currency.

Conferences were left out of the list on purpose in this study, thus faculty depending on a comparative ranking of conference proceedings must evaluate and integrate those venues with those presented. Depending on where an InfoSec program is housed, journals may or may not be the sole currency in regard to intellectual contribution, and the primary resource as reference for research.

6. Conclusion

The general purpose of this study was to identify and comparatively assess the quality of information security specific publishing venues. In both the IS and CS fields, there is clear evidence that information security-focused research can be published in mainstream IS- and CS-centric periodicals. However at the time of this study, there was no other research into information security-focused venues, separate from studies of other disciplines (IS & CS). Therefore the results of this study should be combined with those of either (or both) of these lists, in order to provide a more comprehensive perspective on the publishing opportunities available. Faculty members seeking to create and publish high quality research should strive to have the publications listed in this study accepted by their respective departments, colleges and/or universities to promote the value of information security-specific publishing venues and further establish information security as a discipline in its own right.

Those seeking to publish in peer-reviewed journals with an externally justified ranking are presently limited to discipline or institution specific referents. In the area of information security this has thus been the use of either IS journals or CS journals. We propose that a new category of peer-reviewed journal may now be discernible, the information security journal, with its own identity and a need for its own external mechanism to rank perceived quality. Given that such a category is still in its formative period, many of the journals referenced in this study are also included in the existing IS and CS ranking lists. We anticipate that this may change as journals focused on the specific needs of the information security discipline begin to emerge and service those markets. Over time it may be that the more specific information security journals will not be considered as useable by mainstream IS and CS scholars, and likewise, those traditionally CS and IS journals may no longer be as readily available for publication of information security research results. While there will always be overlap between information security publication venues and the CS and IS venues, this anticipated and ongoing mitosis will make the need for an information security specific journal ranking process even more important.

Faculty with research accountabilities from around the world require access to independent assessments of journal quality so as to add a critical element in the preparation of supporting materials integral to the promotion and tenure process necessary for career advancement. In addition, faculty and students in programs with requirements to study or base research on publications in top-tiered journals in information security will also benefit from a directed list of venues to support their academic and professional development. To that end, we hope this assessment provides an objective measure of the placement of the referenced journals on the peer-reviewed journal quality continuum.

References

- [1] Anderson, R., Moore, T. (2009). Information security: where computer science, economics and psychology meet. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 367 (1898) 2717-2727.
- [2] Bishop, M. (1993). Teaching computer security. *In: Proceedings of the Ninth IFIP International Symposium on Computer Security*, Citeseer, PA, 43-52.
- [3] Cappel, J. (2010). Measuring Journal Quality: Proposed Criteria and their Application to IS Journals. *Issues in Information Systems* 11 (1) 266-273.
- [4] Chua, C., Cao, L., Cousins, K., Straub, D. W. (2002). Measuring researcher-production in information systems. *Journal of the Association for Information Systems*, 3 (1) 145-215.

- [5] Dennis, A. R., Valacich, J. S., Fuller, M. A., Schneider, C. (2006). Research Standards for Promotion and Tenure in Information Systems 1. *Management Information Systems Quarterly*, 30 (1) 1-12.
- [6] Dhillon, G., Backhouse, J. (2001). Current directions in IS security research: towards socio-organizational perspectives. *Information Systems Journal*, 11 (2) 127-53.
- [7] Hardgrave, B. C., Walstrom, K. A. (1997). Forums for MIS scholars. *Communications of the ACM*, 40 (11) 119-124.
- [8] Higgins, J. (1989). Information Security as a Topic in Undergraduate Education of Computer Scientists. *Twelfth National Computer Security Conference*, Baltimore, MD, 553-7.
- [9] Holsapple, C. W., Johnson, L. E., Manakyan, H., Tanner, J. (1993). A citation analysis of business computing research journals. *Information & Management*, 25 (5) 231-244.
- [10] Holsapple, C. W., Johnson, L. E., Manakyan, H., Tanner, J. (1994). Business computing research journals: A normalized citation analysis. *Journal of Management Information Systems*, 11 (1) 131-140.
- [11] Irvine, C. E., Chin, S. K., Frincke, D. (1998). Integrating security into the curriculum. *IEEE Computer*, 31 (12) 25-30.
- [12] Katerattanakul, P., Han, B. (2003). Are European IS Journals underrated? An answer based on citation analysis. *European Journal of Information Systems*, 12 (1) 60-71.
- [13] Kotulic, A. G., Clark, J. G. (2004). Why there aren't more information security research studies. *Information & Management*, 41 (4) 597-607.
- [14] Kozar, K. A., Larsen, K. R. T., Straub, D. (2006). Leveling the playing field: a comparative analysis of business school journal productivity. *Communications of the Association for Information Systems*, 17 (1) 524-538.
- [15] Lowry, P., Romans, D., Curtis, A. (2004). Global journal prestige and supporting disciplines: A scientometric study of information systems journals. *Journal of the Association for Information Systems* 5 (2) 29-80.
- [16] Mylonopoulos, N. A., Theoharakis, V. (2001). On site: global perceptions of IS journals. *Communications of the ACM*, 44 (9) 29-33.
- [17] Neugent, B. (1982). A university course in computer security. *ACM SIGSAC Review*, 1 (2) 17-33.
- [18] Nord, J. H., Nord, G. D. (1995). MIS research: journal status assessment and analysis. *Information & Management*, 29 (1) 29-42.
- [19] NSA. National Centers of Academic Excellence Institutions (2013). http://www.nsa.gov/ia/academic_outreach/nat_cae/institutions.shtml.
- [20] Peffers, K., Tang, Y. (2003). Identifying and evaluating the universe of outlets for information systems research: Ranking the journals. *Journal of Information Technology Theory and Application*, 5 (1) 63-84.
- [21] Rainer, R. K., Miller, M. D. (2005). Examining differences across journal rankings. *Communications of the ACM*, 48 (2) 91-94.
- [22] Ratnasingham, P. (1998). Trust in Web-based electronic commerce security. *Information Management and Computer Security*, 6 (4) 162-6.
- [23] Saltzer, J. H., Schroeder, M. D. (1975). The protection of information in computer systems. In: *Proceedings of the IEEE*, 63 (9) 1278-308.
- [24] Saunders, C., Benbasat, I. (2007). A camel going through the eye of a needle. *MIS Quarterly*, 31 (3) iv-xviii.
- [25] Shoemaker, D., Bawol, J., Drommi, A., Schymik, G. (2004). A delivery model for an Information Security curriculum. In: Dhillon, G. and Furnell, S., eds. *In: Proceedings of the Third Security Conference*, Las Vegas, NV, 3, 11.
- [26] Valacich, J. S., Fuller, M. A., Schneider, C., Dennis, A. R. (2006). Publication Opportunities in Premier Business Outlets: How Level Is the Playing Field? *Information Systems Research*, 17 (2) 107-125.
- [27] Walstrom, K. A., Leonard, L. (2000). Citation classics from the information systems literature. *Information & Management*, 38 (2) 59-72.
- [28] Whitman, M. (2003). Enemy at the gate: threats to information security. *Communications of the ACM*, 46 (8) 91-95.
- [29] Whitman, M. E., Hendrickson, A. R., Townsend, A. M. (1999). Research commentary. Academic rewards for teaching, research, and service: Data and discourse. *Information Systems Research*, 10 (2) 99-109.

- [30] Willcocks, L., Whitley, E. A., Avgerou, C. (2008). The ranking of top IS journals: a perspective from the London School of Economics. *European Journal of Information Systems*, 17 (2) 163-168.
- [31] Zafar, H., Clark, J. G. (2009). Current State of Information Security Research in IS. *Communications of the Association for Information Systems*, 24 (1) 557-96.
- [32] Zickar, M. J., Highhouse, S. (2001). Measuring prestige of journals in industrial-organizational psychology. *The Industrial-Organizational Psychologist*, 38 (4) 29-36.