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Relevant Research Areas in IT Service Management: An Examination of Academic and Practitioner Literatures

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Abstract:

Practitioners and academics alike have highlighted that information systems (IS) research may currently have limited use and value to practitioners. Further, research provides examples of positive links between management practices prevalent in the media and their influence on societal views. We focus on increasing relevance of future academic research to practitioners by identifying sources of misalignment between practitioner and academic literatures on the topic of information technology service management (ITSM) and by developing a possible research agenda to address these misalignments. We employ an entity annotator and keyword analysis to compare the main topics evident in academic and practitioner literatures on ITSM and focus on those salient in practitioner literature. Our results suggest that the topics of framework co-implementation, regulations, ITSM tools, gamification, and cloud computing all present fertile grounds for relevant research in ITSM and IS more broadly. Thus, our paper offers a unique way for academics to understand how they can best assist practitioners while increasing the relevance of academic research.

Keywords: Relevance, Entity Annotator, IT Service Management, Information Technology Infrastructure Library.

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1 Introduction

The relevance of information systems (IS) research to practice is a prevalent issue in the IS academic community (Rosemann & Vessey, 2008). Ramiller and Pentland (2009) argue that a significant gap exists between scholarly research and practitioner needs. Researchers have expressed concern that IS researchers are not studying topics relevant to practitioners, while practitioners are not accessing and using academic research (Straub & Ang, 2011). Further, research has found IS academics to lag behind the dynamic environment of IS practitioners' world in that they publish papers only after events have occurred and technologies have been widely implemented (Hirschheim & Klein, 2012; Kock, Gray, Hoving, Klein, & Myers, 2002).

One can see the disconnect between IS researchers and practitioners in the lack of interaction between the two groups. Because it is the business community who converts IS theory into practice and hires the field's graduates, the relevance of IS research for their practices should be paramount (Hirschheim & Klein, 2012). Instead, there remains limited interaction between practitioners and academics. Few academics tend to attend trade shows and few practitioners tend to frequent academic meetings. Practitioners seem to lack demand for IS academic research outcomes and may also perceive that IS research cannot be both relevant and rigorous (Rosemann & Vessey, 2008).

While prior literature has acknowledged that such a relevance gap exists, we lack established research methods that one can use to identify areas of practitioner interest. We apply a novel approach to detect the differences in how practitioners and academics discuss fields in IS. As the practitioner journals and other business literature that practitioners read will likely influence their thoughts and behaviors (Carroll & McCombs, 2003), it follows that one way of identifying gaps in academic research is to compare academic and practitioner literatures. Therefore, we review the literature based on a semantic entity annotator (SEA) and keyword analysis to statistically identify any differences between the topics that the two literatures discuss. We suggest that one can use this process as a basis to develop a research agenda relevant to practitioners that subsequent academic research can address. Our approach helps one detect gaps in academic knowledge in a systematic, comprehensive, and statistically significant way. It offers a useful foundation for increasing the alignment between the discussions that academics and practitioners have with each other.

Researchers in the IS community widely acknowledge the importance of solid literature reviews. Due to the field's ever-evolving nature, literature reviews are important for quickly gathering and summarizing the existing literature, expanding knowledge, and addressing relevant research gaps (Bandara, Furtmueller, Gorbacheva, Miskon, & Beekhuyzen, 2015). However, although several different types of literature reviews exist in the IS field (Paré, Trudel, Jaana, & Kitsiou, 2015), these literature reviews largely focus on academic research and seldom emphasize the practitioner literature. Further, few IS papers describe methods to uncover research gaps. Müller-Bloch and Kranz (2015) constitutes one exception: this paper highlights the need for methodological guidelines that indicate how to uncover research gaps in literature reviews. Thus, in this paper, we compare practitioner and academic literature to understand possible future research directions. We address Müller-Bloch and Kranz (2015) by providing detailed guidelines for uncovering areas of misalignment between these literatures. We focus in particular on the least common type of research gaps they identified—the practice-oriented research gaps, which target professional behavior or practices that academic research does not yet cover.

We also contribute to the debate concerning the extent of relevance of IS research for practitioner, based on whether the topics that IS academic research discusses closely reflects practitioner literature (Baskerville & Myers, 2009) and, thus, whether academic research may be relevant to practitioners' interests. Extensive alignment between the topics discussed by the practitioner and academic literatures would indicate such relevance. We apply our methodology to the information technology systems management (ITSM) field as an example of an area of IS that is widely used and popular in practice (Iden & Eikebrokk, 2013; Marrone & Kolbe, 2011).

Several indicators highlight the prevailing awareness and widespread implementation of ITSM, which reflects its importance in the IS sector. The professional association IT Service Management Forum (itSMF) currently comprises over 6,000 member companies that represent more than 40,000 individuals in over 50 national chapters, and membership continues to grow each year (itSMF International, 2015). The association argues that the benefits of adopting ITSM practices and joining it become ever more prevalent as organizations come to increasingly depend on using technology to design and deliver their goods and services to markets. IT professionals who want to support their businesses using flexible and innovative

solutions and minimize the costs they incur to deliver, support, and govern their ICT view ITSM as necessary (itSMF International, 2015). In 2014, a study addressing senior executives found that 59 percent of organizations surveyed had implemented the Information Technology Infrastructure Library (ITIL), a widely used ITSM framework (Connolly, 2014b). However, we also focus on the ITSM field given that, in searching databases and individual journals, we found a slowdown in the number of practitioner and academic publications on the topic. The rise and subsequent fall we observed in the number of publications focused on ITSM suggests that it may have followed a full fashion cycle of the type that Abrahamson and Fairchild (1999) describe. These authors also provide evidence that the upswing in academic publications may come after that in practitioner publications, which further stresses the importance of examining a field after it has completed a fashion cycle to fully understand the extent of alignment between these literatures. By obtaining data on a recent discourse, we can better understand the extent of alignment between the literatures while reducing the potential for a time lag in academic publications to influence the results (Kock et al., 2002).

This paper proceeds as follows: in Section 2, we review the literature and discuss the methodology we used to determine which topics concerning ITSM tend to appear most frequently in the practitioner and academic literatures. In Section 3, we compare the topics evident in these literatures and extract topics that are salient in practitioner literature when compared to academic literature. In Section 4 and 5, we present and discuss the findings of the research; specifically, we focus on four key themes we uncovered. We also highlight the gaps in the academic research and suggest questions for future analysis. Finally, in Section 6, we conclude the paper with a brief summary and critique of the findings.

2 Literature Review

2.1 IT Service Management

We consider the practitioner and academic discourse in the ITSM field because many IS professionals consider the area to be important (Marrone & Kolbe, 2011). ITSM concentrates on the management and deliverance of IT services to assist business objectives and customer needs (Conger, Winniford, & Erickson-Harris, 2008). It is a set of processes that ensures IT processes perform to the level of quality that the customer has agreed on (Winniford, Conger, & Erickson-Harris, 2009), and Marrone and Kolbe (2011) add that ITSM is also an approach to IT operations that focuses on IT services, consumers, service-level agreements (SLA), and the handling of daily IT activities using processes. Various frameworks and standards of ITSM exist. ITIL is regarded as the most common approach (Hochstein, Tamm, & Brenner, 2005) and many other frameworks—including Microsoft's MOF and ISO 20000—are based on ITIL (Galup, Dattero, Quan, & Conger, 2009).

Much of the existing literature has examined case studies of ITSM implementation across different countries, industries, and organizations (Ahmad, Amer, Qutaifan, & Alhilali, 2013; Drechsler, 2013; Lucio-Nieto, Colomo-Palacios, Soto-Acosta, Popa, & Amescua-Seco, 2012; Yamakawa, Noriega, Linares, & Ramírez, 2012). Other literature has focused on describing the relative implementation status of ITSM among different countries (Marrone, Gacenga, Cater-Steel, & Kolbe, 2014), the relationships between ITSM frameworks and factors such as process management (Iden & Eikebrokk, 2014a), and business-IT alignment (Kashanchi & Toland, 2006).

Researchers have also sought to address the motivations behind the implementation of ITSM, its benefits, and factors necessary for its success. The literature addresses common motivations for implementing ITSM such as improving operational efficiency and reducing spending on IT (Cater-Steel, 2009; Iden & Eikebrokk, 2014b; Pollard & Cater-Steel, 2009), enhancing focus on delivery of services (Cater-Steel, 2009; Drechsler, 2013; Iden & Eikebrokk, 2014b; Pollard & Cater-Steel, 2009), refining alignment with both external and internal stakeholders (Cater-Steel, 2009; Mohammed, 2008; Pollard & Cater-Steel, 2009), and improving the quality of goods and services and, thus, customer satisfaction (Drechsler, 2013; Iden & Eikebrokk, 2014b; Lucio-Nieto et al., 2012; Pollard & Cater-Steel, 2009). Researchers have argued that most important factors for a successful ITSM implementation include senior management involvement and support (Iden & Langeland, 2010), appropriate staff training (Drechsler, 2013; Wan & Jones, 2013), organizational resources (Iden & Eikebrokk, 2014c), and a dedicated change management team (Drechsler, 2013; Yamakawa et al., 2012).

ITSM frameworks are associated with a large number of benefits, including most predominantly improved service quality (Cater-Steel, 2009; Marrone & Kolbe, 2011), and customer satisfaction (Drechsler, 2013;

Iden & Eikebrokk, 2014b; McBride, 2009). The implementation of ITSM may also improve internal communications, clarify negotiation of service level agreements and increase the documentation and consistency of IT processes (Cater-Steel, 2009). ITSM implementation is positively correlated with process documentation, process improvement, process certification and process monitoring (Iden & Eikebrokk, 2014a). Finally, it also often results in reduced IT expenditures, the clarification of roles and responsibilities (Drechsler, 2013; Iden & Eikebrokk, 2014b) and the transition from a traditional to a strategic IT capacity (Lucio-Nieto et al., 2012).

2.2 Role of Practitioner Literature

Several academic papers indicate the important role that the popular press plays in influencing corporate practices (Grafström & Windell, 2011; Mazza & Alvarez, 2000; McCombs & Shaw, 1972). Instead of being passive distributors of the news, media entities are active in spreading and creating knowledge (Mazza & Alvarez, 2000a), which shapes their practices, events, and ideals (Schudson, 2003). Business media may help organizations define the significance and meaning of corporate practices by creating, using, and reconstructing explanatory accounts and frames of reference (Deephouse & Heugens, 2008). Deephouse and Heugens (2008) highlight the media's influential role in intermediating information and suggest that organizations will likely incorporate the social issues that the media emphasizes into their practices. Similarly, Grafström and Windell (2011) argue that the media is influential in shaping corporate agendas. The media tends to support the beliefs of its target audience because these consensual positions are linked to its audience's values (Vaara & Tienar, 2008). Thus, the popular press reflects the views of their audiences in their discussions to ensure their survival and effectiveness (Deephouse & Heugens, 2008). As a result, one can argue this literature to best reflect the topics of relevance for practitioners. Not only does it help shape the corporate practices that practitioners implement in their organizations, it also reflects their beliefs and values.

In the context of ITSM, IT managers and senior management do possibly internalize the topics regularly discussed in the business media. These topics then become regarded as issues that can be managed by, and are relevant to, ITSM frameworks. Thus, practitioners assimilate the views of those publishing in the trade journals. Drawing on these ideas, we analyze how practitioner journals have framed ITSM over the past sixteen years and how this framing contrasts with the topics dealt with in the academic literature.

3 Methodology

To propose new relevant research areas in the TSM field, we first examined the misalignments between how the practitioner and academic literatures discuss topics. Fink (2013) explains that any literature review must be systematic in following a methodological approach, explicit in explaining the processes used in its conduct, comprehensive in including all relevant material, and reproducible by other scholars who wish to study the same or a similar topic. We reviewed the literature to identify and evaluate relevant topics for both academics and practitioners. In our approach, we also incorporated the recommendations of Bandara et al. (2015) because they focus on providing guidelines for a tools-based systematic review. Our using a tools-based approach enhanced the accuracy and comprehensiveness of the review process (Bandara et al., 2015).

3.1 Gathering of data

The first step that the literature commonly proposes involves identifying the review's goals and the literature that is most likely to help one achieve that goal (Bandara et al., 2015; Okoli & Schabram, 2010; Schryen, 2015). We define our main goal as being to identify sources of misalignment between academic and practitioner literatures on the topic of ITSM in order to use such sources to develop a research agenda that addresses relevance for practitioners. We draw on both academic and practitioner literature sources to do so. We argue that, while academic literature reflects academics' discussions, ideas, and thoughts, practitioner literature contributes useful insights into the common understandings of key issues associated with a practitioner community. In our reflections on practitioner literature, we thus draw on the reasoning of Juravle and Lewis (2008), who suggest that this literature source contains industry insiders' perspectives on the inter-relations between the industry's institutions and those key issues that the literature discusses.

For the academic literature, we searched the databases EbscoHost, Scopus, and Web of Science. Having identified the terms "ITIL", "ISO20000", and "Microsoft MOF" as intrinsically related to ITSM in the

literature review section, we used these terms and their variations (e.g., “ITIL” and “IT Infrastructure Library”) as our keywords for the database search. Focusing on a time span of 16 years (from 1 January, 2000, to 1 May, 2016), we could comprehensively examine the diffusion of ITSM. We included only those papers written in English and concerning the implementation of ITSM in an organizational setting. We eliminated duplicate papers and excluded studies that examined ITSM education because we focused on the relationship between ITSM and practitioners. While we also excluded literature reviews on the grounds that they summarize other academic papers, we did use them to corroborate that we incorporated all papers that met our inclusion criteria.

When selecting academic publications, we applied the same list that Iden and Eikebrokk (2013) used in their systematic literature review on ITSM. We provide this list in Appendix A. Using the databases we mention above, we searched for both the academic journal papers and conference papers included in this list. Through this selection process, we could identify academic papers that stemmed from sources that reflect the work of scholars in the IS community. We decided to base our research on these papers' abstracts because they summarize the motivation, methodology, results, and conclusions of a research paper (deVilliers & Dumay, 2014). Abstracts tend to strongly indicate a paper's content; indeed, Crawford, Pollack and England (2006) found that using a paper's full text provided little advantage over using the abstract for identifying the main keywords. Abstracts rather than full-length papers help to reduce erroneous noise and are more comparable in length with practitioner publications.

As with the academic literature, we also focused on including practitioner publications from only those sources particularly pertinent to the IS community. We identified academic papers that drew on practitioner literature in their own research on a topic in information systems and provided a list of their sources. Kumar and Stylianou (2014) used *InformationWeek*, *Datamation*, *CIO Magazine*, and *ComputerWorld*, while Gonzales, Bagchi, Udo, and Kirs (2011) searched *ComputerWorld* and *InfoWorld*. Because newspaper articles are widely prevalent in discussions of how the ideas and behaviors of practitioner communities are shaped (Mazza & Alvarez, 2000), we also considered these sources in searching the practitioner literature. Mazza and Alvarez (2000) stress the importance of the popular press (namely, newspapers and magazines) in producing corporate ideas and behaviors. They argue that the popular press (in their example, two newspapers) is an automatic channel for generating and spreading knowledge. More specifically, we identified *The New York Times*, the *Financial Times* and *The Wall Street Journal* as important for our search because researchers have recognized them as relevant when conducting studies on IS (Schryen, 2015). While one may argue that consulting literature is also important for practitioners, we decided to exclude this body of literature because existing literature distinguishes between the consultancy and practitioner domains. While practitioner media actively functions as a communication channel, consultants play more of an indirect role by providing discourse on concepts and ideas (Benders, Nijholt, & Heusinkveld, 2007).

We used the Factiva database to conduct the search because it covers the target practitioner literature listed above. In our search of the practitioner literature, we included all the practitioner journals listed above (i.e., *InformationWeek*, *Datamation*, *CIO Magazine*, *Computerworld*, and *InforWorld*) and newspapers (i.e., *The New York Times*, the *Financial Times*, and *The Wall Street Journal*). As Factiva did not include *Datamation* as a source, we separately visited the *Datamation* website and downloaded the relevant articles.

From our entire sample, we excluded any explicit advertisements and duplicates or similar publications to help reduce potential sources of biasedness. We also removed any publications that mentioned ITSM only to refer to an ITSM survey without explaining the outcomes of the survey or any other ideas associated with ITSM. As with the academic literature, we retained all other publications written in English that explored the use of ITSM in a corporate setting. The practitioner publications included in this study also covered the same dates as the academic literature. We examined a long period of time because we wanted to include a wide number and range of perspectives on ITSM that stem from both the practitioner and academic literatures.

We independently reviewed the 105 academic papers that we identified. We then reviewed our results together by discussing whether to include any papers that we disagreed about. This process resulted in 73 papers. We applied a similar strategy to the practitioner literature and, after applying the inclusion and exclusion criteria discussed in the previous paragraph, 411 out of 517 publications remained. We identified topics in the academic and practitioner publications using a semantic entity annotator. We derived the statistical significance of the topics that appeared unusually frequently in the practitioner as

opposed to the academic literature using keyword analysis. We explain this process in detail in Section 3.2.

3.2 Descriptive Statistics

Our search of Factiva for publications published during the 16-year period we describe above yielded 517 publications of which 411 met our criteria. Table 1 identifies the publication sources, and Table 2 depicts the years of publication.

Table 1. Sources for Practitioner Publications

Source	Count
<i>CIO Magazine</i>	32
<i>ComputerWorld</i>	212
<i>Datamation</i>	24
<i>Financial Times</i>	34
<i>InformationWeek</i>	82
<i>InfoWorld</i>	19
<i>The New York Times</i>	5
<i>The Wall Street Journal</i>	3

Table 2. Years of Practitioner Publications

Year	Count
2000-2003	12
2004-2007	223
2008-2011	126
2012-2016	50

Similarly, our review of the academic journals and conferences yielded 73 scholarly papers published during the 16-year period. One can find information regarding their sources and year of publication in Tables 3 and 4, respectively (see next page). The 73 academic abstracts had 18,262 words in total, with 910 topics assigned to the texts. We assigned an average of 13 topics to each academic abstract.

3.3 Semantic Entity Annotator

We first applied a semantic entity annotator (SEA) called TAGME, used for systematically identifying key topics in the literatures while reducing bias and the potential for human error. A SEA is a tool that can identify meaningful term sequences (mentions) in a section of text and annotate them with unambiguous identifiers (entities) from a larger catalogue such as Wikipedia (Piccinno & Ferragina, 2014). This process effectively negates the consequences associated with individuals' personally categorizing text and interpreting the specific text wording in the context of their knowledge and experience as with manual coding analyses (Vitale, Ferragina, & Scaiella, 2012).

When conducting content analysis, one can use computer-assisted qualitative data analysis software (CAQDAS) tools, which help one to obtain an accurate and transparent overview of the data while also auditing the overall data analysis (Welsh, 2002). However these tools often either require some extent of manual coding (Bandara et al., 2015) or are difficult to use to accurately compare different literatures. For example, NVivo, which relies on pre-existing codes to code data in a largely manual manner (Welsh, 2002), results in data analysis that is highly subjective, involves a high potential for bias, and requires researchers to perform reliability and validity checks (Sotiriadou, Brouwers, & Le, 2014). While Leximancer can increase reliability and reproducibility because it produces a taxonomy automatically rather than through manual coding (Angus, Rintel, & Wiles, 2013), the way it do say may also be a weakness. Leximancer's automated process produces a tailored taxonomy based only on the texts that it processes, which means that it is difficult to compare different literatures that may rely on different terminology and results from different studies. Introducing a new data set would also require one to

produce a new taxonomy, which may differ vastly from the first. Our tool helps to overcome these issues because it merges strings that have the same meaning, such as United States of America, U.S., and USA. SEA identify topics and offer the additional advantage of normalizing the concepts to which they refer (Khalid, Jijkoun, & Rijke, 2008). As an example, although the name “Michael Jordan” has several separate entries in Wikipedia, knowing that “Bulls” mentioned elsewhere in the text is associated with the NBA team Chicago Bulls helps link a mention of “Jordan” to the basketball player (Han, Sun, & Zhao, 2011). SEA attribute each meaningful mention in a text to an annotation in a catalogue such as Wikipedia (Ferragina & Scaiella, 2010), which means that they link mentions with the same meaning to the same keyword. As such, one can more easily compare different data sets with SEA than with Leximancer. Using a keyword analysis after applying the SEA also helps one to generate statistically significant results in terms of the frequency of times they appear in the texts. As such, we can compare the topics that appear in different bodies of texts in a systematic and statistically significant manner.

Table 3. Sources for Academic Publications

Source	Count
<i>Communications of the Association for Information Systems</i>	2
<i>Decision Support Systems</i>	2
<i>Information and Management</i>	1
<i>Information Systems Journal</i>	1
<i>Information Systems Management</i>	5
<i>Information Systems Research</i>	1
<i>International Journal of Information Management</i>	3
<i>Journal of Computer Information Systems</i>	1
<i>Journal of Management Information Systems</i>	2
<i>European Journal of Information Systems</i>	1
<i>Journal of Strategic Information Systems</i>	1
Americas Conference on Information Systems (AMCIS)	30
European Conference on Information Systems (ECIS)	6
International Conference on Information Systems (ICIS)	5
Pacific Asia Conference on Information Systems (PACIS)	1
Hawaii International Conference on System Sciences (HICSS)	11

Table 4. Years of Academic Publications

Year	Count
2000-2003	0
2004-2007	12
2008-2011	37
2012-2016	24

According to Piccinno and Ferragina (2014), one can divide the entity annotation process into three stages: spotting, disambiguation, and pruning. During spotting, the entity annotator scans the input text for term sequences to produce a set of possible mentions. The tool retrieves a list of candidate entities from Wikipedia for each mention that contain all the possible meanings that it can associate with the mention. Wikipedia pages are designated as entities due to their rapidly increasing nature and their useful ability to provide a balance between structure and coverage (Cornolti, Ferragina, & Ciaramita, 2013). During the disambiguation stage, the entity annotator connects a score with each candidate entity and models how strongly the entity depicts the mention with reference to the text’s context. The connections with the highest scores become the candidate annotation. Finally, during pruning, the entity annotator decides if it will discard a candidate annotation based on the other annotations that it has made to the text. This

decision will also depend on whether the annotation makes sense given the overall context of the text (Piccinno & Ferragina, 2014).

We chose TAGME as the entity annotator we used because researchers have recognized as one of the most efficient publically available semantic annotator systems (Cornolti et al., 2013; Cuzzola, Jovanović, Bagheri, & Gašević, 2015). Research has shown it to produce effective results when applied to a number of texts of varied lengths (Ferragina & Scaiella, 2010). Although using Wikipedia as a catalogue prevents the annotator from identifying all mentions, it nevertheless selects better candidates from a well-defined corpus than other entity annotators (Cornolti et al., 2013).

Cuzzola et al. (2015) developed a set of recommended parameter values that provide the best results for TAGME. The recommended parameters used in this study are $\epsilon = 0.427$, $long_text = 10$, and $\rho = 0.1613$. According to Cuzzola et al. (2015), these values enable TAGME to offer both an appropriate number of topics and minimize annotation errors. While these parameters are not optimal for all scenarios and TAGME is customizable to suit specific text types or topics, they generated useful results for our purposes.

3.4 Using TAGME for the Literatures

We merged the headline of each trade journal clipping with its leading paragraph and body text. Table 5 shows an example of a trade journal paper and the TAGME results. The first sentence of the text is the publication's title. Researchers should note that the keywords might appear more than once in the TAGME results because the results reflect the topics in the order they appear in the text. We reviewed the results from the entity annotator for all practitioner texts and excluded six false positives topics from the investigation. These false positives were "ade easily", "when we on", "for but not with", "WHATS'On" (Software), "laconic phrase", and "Paul Youll".

Table 5. Example of TAGME Results for a Practitioner Publication

<p>Practitioner publication (Bender, 2014).</p>	<p>"Sedgman Unearths Greater Value for Cost with ITSM Switch."</p> <p><i>Sedgman has cut its IT service management costs in three by shifting ITSM platforms, according to Sedgman IT Manager, Andrew Reid.</i></p> <p><i>Sedgman is a mining engineering company based in Brisbane with offices globally and mine operation sites across Australia. It has more than 650 staff. Reid said his IT responsibilities include operations, service desk, service management, network, server, engineering applications for the company globally.</i></p> <p><i>"Cost is a key challenge," Reid told Computerworld Australia. "We're expected to do more with less."</i></p>
<p>TAGME result</p>	<p>ITSM_Trade, mining engineering, Brisbane, Australia, service desk (ITSM), server (computing), <i>Computerworld</i>, more with less</p>

We used concept collocation to address the fact that practitioner publications may cover more than one topic in an article (Cho & Khang, 2006; Mitchelstein & Boczkowski, 2010). Concept collocation is a technique that seeks to identify the positioning of concepts surrounding a target topic. These concepts are believed to frame the target topic and, thus, tend to be related (Faro, Giordano, & Spampinato, 2011). In our paper, we use collocation to understand the topics mentioned together with ITSM in the practitioner literature. To simplify this process, we converted all terms related to ITSM returned by TAGME (i.e., "Information Technology Infrastructure Library", "ITIL", "IT service management" and "ISO/IEC 20000") to "ITSM_Trade" so that we could easily identify the target topic, ITSM_Trade and, thus, ITSM. Previous research has indicated that a topic window for concept collocation of five to 10 terms is effective in revealing the concepts most closely related to the target topic (Lau, Song, Li, Cheung, & Hao, 2009). Hence, for this study, we chose to examine only those five topics to the left and right of the target topic ITSM_Trade. For this step, we used the program AntConc, which created a file with the generated results from which to conduct a keyword analysis.

The use of collocation returns more reliable results and allows for increased reproducibility by semantically filtering the results returned and, thus, reducing erroneous results and noise (Faro et al., 2011). Researchers in other fields have also applied the methodology of concept collocation, such as medicine (Hristovski, Friedman, Rindfleisch, & Peterlin, 2006; Jelier et al., 2007), technology (Su & Lee, 2010), and social tagging (Wu, Yang, Yu, & Hua, 2009).

For the academic literature, we merged the paper titles with their abstracts and removed any copyright information. We striped structured abstracts of their organizing keywords (e.g., purpose, findings, and conclusion). Table 6 shows an example. Given that academic abstracts generally contain more precise information and better summarize the papers they come from, we considered all topics that TAGME derived from the academic publications for analysis.

Table 6. Example of TAGME Results for an Academic Publication

<p>Academic publication (Jia & Reich, 2013).</p>	<p>“IT Service Climate, Antecedents and IT Service Quality Outcomes: Some Initial Evidence.”</p> <p><i>Although many IT service management frameworks exist, we still have limited theoretical understanding of IT service quality within a broader nomological network. Building on recent conceptual work on the IT service climate construct, this study empirically establishes it as a predictor of IT service quality using survey data from both IT units and their clients. Also examined was a set of antecedents which provide a foundation upon which a favorable service climate can be built. The IT service climate instrument, when incorporated into employee feedback initiatives, can provide guidance to IT executives about practices to improve service quality.</i></p>
<p>TAGME result</p>	<p>ITSM_Academia, Nomological network, Empiricism, Employment, Feedback</p>

We stored both the topics returned for the practitioner and academic literatures in two Excel files, one for each type of literature. By doing so, we could effectively examine the data and the contexts in which the topics appeared.

3.5 Keyword Analysis

Next, we conducted a keyword analysis to confirm the statistical significance of the topics that the entity annotator highlighted. Keyword analysis is a technique developed in the corpus linguistics field that helps one identify key topics in texts by comparing the relative frequencies of keywords that appear in two or more literature bodies (Crawford, Pollack, & England, 2006). The technique deems a word key if a statistical analysis (such as log-likelihood score) shows it to be less than or equal to a previously specified p-value (Seale, Ziebland, & Charteris-Black, 2006), which indicates that the word appears unusually frequently in the text of interest than in the text to which one compares it (i.e., the “reference corpus”). Researchers have widely used the tool to establish the similarities and differences between the keywords of a large range of texts (Baker, 2004; Crawford et al., 2006; Gabrielatos & Baker, 2008; Seale et al., 2006). In our case, we considered the frequency of the topics that appeared in the practitioner literature using the academic literature as a “reference corpus”. We used the files we constructed that contained the TAGME results after applying concept collocation to the practitioner literature. By using keyword analysis, we could draw important and meaningful comparisons between these two literatures.

According to Baker (2006), a major advantage that keyword analysis has over traditional qualitative thematic analysis is that the computer determines keywords through statistical analysis instead of the researcher through subjective judgment. As such, researchers do not need to know what the important keywords are before they begin the analysis, nor do they need to update—and possibly restart—the coding process should they discover an important keyword mid-way through the process. As a result, keyword analysis is an extremely rapid and useful way to direct researchers to particular differences in the topics that texts mention. This technique reduces the potential for researcher bias (Baker, 2004) and is often more economical and replicable than traditional qualitative thematic analyses (Seale et al., 2006).

4 Results

In this section, we identify the topics that appeared most often in the practitioner literature as compared to the academic literature for ITSM. We then explore how the salient topics in practitioner literature are mentioned in context. On this basis, we propose a research agenda based on areas of interest to practitioners and that emphasizes how one might more broadly apply these findings for ITSM to IS.

Table 7. Most Frequently Mentioned Topics in Trade and Academia (Italic Words Appear as One of the Top 30 Topics in Both Literatures)

	Academic literature		Practitioner literature	
	Frequency	Topic	Frequency	Topic
1	31	<i>Organization</i>	90	<i>Best Practice</i>
2	29	<i>Information Technology</i>	75	<i>Management</i>
3	23	<i>Management</i>	60	<i>Business</i>
4	22	<i>Business Process</i>	60	<i>Business process</i>
5	15	<i>Service (Economics)</i>	49	<i>Organization</i>
6	11	<i>Business</i>	48	<i>CoBIT</i>
7	11	<i>CoBIT</i>	48	<i>Information Technology</i>
8	10	<i>Best Practice</i>	48	<i>Technology</i>
9	10	<i>Technology</i>	45	<i>Software</i>
10	9	<i>Implementation</i>	45	<i>Service (Economics)</i>
11	8	<i>Corporate Governance of Information Technology</i>	34	<i>Australia</i>
12	8	<i>Information Technology Management</i>	34	<i>Service Desk (ITSM)</i>
13	8	<i>Strategy</i>	33	<i>Project Management</i>
14	7	<i>Knowledge</i>	31	<i>Data Center</i>
15	7	<i>Outsourcing</i>	29	<i>Office of Government Commerce</i>
16	6	<i>Service Level Agreement</i>	29	<i>Information</i>
17	6	<i>Software Development</i>	28	<i>Infrastructure</i>
18	6	<i>System</i>	27	<i>Helpdesk</i>
19	6	<i>Technical Support</i>	26	<i>Software Development</i>
20	5	<i>Australia</i>	25	<i>Application Software</i>
21	5	<i>Decision Making</i>	25	<i>Employment</i>
22	5	<i>Employment</i>	24	<i>Customer</i>
23	5	<i>Information</i>	24	<i>Outsourcing</i>
24	4	<i>Capability Maturity Model Integration</i>	21	<i>Corporate Governance of Information Technology</i>
25	4	<i>Communication</i>	20	<i>Six Sigma</i>
26	4	<i>Customer</i>	19	<i>Information Technology Management</i>
27	4	<i>Individual</i>	17	<i>Capability Maturity Model Integration</i>
28	4	<i>Industry</i>	17	<i>System</i>
29	4	<i>Insight</i>	16	<i>Prince 2</i>
30	4	<i>Planning</i>	16	<i>Sarbanes Oxley Act</i>

4.1 Frequency of Topics Discussed in Practitioner and Academic Publications

Table 7 shows the top 30 most frequently used terms in the practitioner and academic literatures. Both literatures commonly discussed the topics in italics. Note that the topics that appear were the titles of the Wikipedia pages that TAGME linked with mentions of certain words in the publications. As Table 7 indicates, both practitioners and academics discussed such topics as “best practice”, “management”, “business process” and “CoBIT” when discussing ITSM. For each literature, eight of the 10 most frequently used topics also appeared regularly in the other literature. This finding suggests that the literatures view many of the same topics as highly important, which conflicts with the assertions of several scholars who argue that practitioners do not find academic research that relevant (Hirschheim & Klein, 2012; Ramiller & Pentland, 2009; Straub & Ang, 2011).

However, the table also shows that several of the most frequently used topics differed, which nevertheless suggests a certain degree of misalignment. The practitioner literature tended to focus on topics associated with the physical implementation and application of ITSM, such as “software”, “data center”, and “service desk”. Contrarily, the academic literature more frequently highlighted the idea of implementation, including “corporate governance of information technology”, “implementation”, “strategy”, and “knowledge”. One can also see clear discrepancies between the topics that the literatures most often described. The top three topics for academics were “organization”, “information technology”, and “management”, while the top three topics for practitioners were “best practice”, “management”, and “business process”. These results suggest that the two literatures may also place different levels of emphasis on topics.

Given that academics are unlikely to use company names (i.e., “ITSM Forum” (39 mentions in practitioner literature), “Hewlett-Packard” (27 mentions), “IBM” (26 mentions), and “BMC Software” (23 mentions)) and specific ITIL processes (i.e., “change management” (58 mentions) and “configuration management” (19 mentions)) in their abstracts, we removed these topics from the practitioner topics we present in Table 7 below and the subsequent keyword analysis. For a similar reason, we also excluded any topics associated with a scientific methodology such as “research” (13 mentions in academic literature), “case study” (10 mentions), “goal” (10 mentions), “concept” (8 mentions), “conceptual model” (7 mentions), “methodology” (7 mentions), “empirical” (6 mentions) and “experiment” (5 mentions) used in the academic papers from the table.

4.1.1 Finding 1: Co-implementation of Frameworks

Our findings indicate that practitioners more frequently discuss how organizations combine different frameworks to best support the use of ITSM in their organizations. For clarification, we identify the Information Technology Infrastructure Library (ITIL), ISO 20000, and Microsoft MOF as ITSM frameworks, while the publications discuss other frameworks such as CMMI, PRINCE2, and COBIT as belonging to the wider spectrum of IS frameworks. A survey conducted by CIO Australia in conjunction with Monash University and Deakin University found that firms frequently co-implement frameworks: more than half of the respondents had implemented ITIL and PRINCE2 and large numbers had also implemented CoBIT, CMMI, and RiskIT (Connolly, 2014a). Our findings show similar results in that frameworks such as “CoBIT” (practitioner mentions (P):46), academic mentions (A):11), “Six Sigma” (P:20, A:1), “CMMI” (P:16, A:4), “PRINCE2” (P:15), and the “ISO27000 series” (P:14) often appear as topics surrounding ITSM in the practitioner literature.

As indicated by our results from the keyword analysis, practitioners also often discuss PRINCE2 usually in the context of co-implementing frameworks associated with ITSM. Practitioners consider that organizations may use PRINCE2 in conjunction with ITIL in transforming their IT functions (Connolly, 2014a; Pauli, 2008a), which changes the way they develop and implement services (Cane, 2007). In the context of project management, the combination of PRINCE2 and ITSM frameworks helps organizations align their IT services with their business operations and outline operational guidelines for IT governance. It does so by developing clear expectations of IT deliverables and enforcing prudence in technology spending (Pauli, 2008b).

Practitioners view that most enterprises require multiple frameworks because one ITSM framework cannot fully satisfy organizational requirements. Many organizations’ best option is to implement one leading standard such as ITIL but supplement it with other aligned standards in business functions (Biddick, 2011; Rowsell-Jones, 2008). Practitioners suggest that the commonly shared benefits of implementing these frameworks together include helping to align IT services with corporate functions, indicating acceptable use and establishing rules for appropriate IT governance. Organizations can co-implement frameworks to

navigate conflicts between IT and the organization, lowering costs and highlighting what the organization can expect from IT deliverables (Pauli, 2008b). Companies may also co-implement infrastructure control systems such as ITIL and COBIT to support operational, strategic, and innovation alignment (Andriole, 2006). Practitioners view these frameworks as complementary rather than competitive. Although employees at Capital One Financial Corporation view CoBIT as the basis of their IT frameworks, they have also integrated other frameworks to standardize terminology and ensure their metrics can support the necessary frameworks (Anthes, 2005a).

Organizations may use such frameworks as COBIT, ITIL, and the ISO 27000 series for different purposes. While ITIL helps enhance internal IT services, COBIT assesses IT controls, and ISO 27001 is useful for IT governance (Violino, 2006). Practitioners relate ISO standards, including ISO 27001, ISO 20000, and ISO 22301 to information security and business continuity, which helps the IT department reassure management and customers that organizational data and processes are safe and secure (Franklin, 2015). IT organizations may integrate such frameworks to ensure that they reflect best practices across their entire range of information security aspects (Violino, 2006).

We found less evidence for the idea of combining frameworks. Most papers only consider the implementation of one framework at a time, most commonly ITIL. Fewer papers describe the co-implementation of frameworks in IT business environments. While limited papers present evidence that firms co-implement CoBIT and ITIL (Cater-Steel, Tan, & Toleman, 2006; de Espindola, Luciano, & Audy, 2009; Lapão, 2011; Vogt, Küller, Hertweck, & Hales, 2011), practitioners discuss a wider range of frameworks that organizations use simultaneously. Co-implementation forms a key component of properly understanding how organizations use ITSM.

4.1.2 Finding 2: Infrastructure Discourse

One discourse that often appears in the practitioner literature concerns how ITSM can help organizations manage IT infrastructure issues concerning their data centers, servers, and networks. Through adopting ITIL, practitioners consider that one may solve issues about server or facility outages, company-wide application problems, and downed networks more quickly and efficiently (Ambrosio, 2008; Bender, 2014).

When discussing ITIL v2, practitioners often focus on ITSM's ability to enhance the efficiency of data centers. The practitioner literature often refers to this version to as a set of best practices for IT data centers, which includes how IT managers handle data center operations, system management and troubleshooting tools, and how they use the information gathered by a data center's network (Babcock, 2007). The literature suggests that ITIL offers vast benefits for data centers in that it makes processes more easily documentable, repeatable, and auditable; cuts annual IT costs by up to 25 percent (Forrester Research, cited by Babcock, 2007); and helps reduce the time associated with resolving IT problems (Thibodeau, 2005).

Practitioners view ITIL as a way to efficiently manage processes across IT departments that support networks and databases (Bender, 2014). They suggest that doing so minimizes the costs associated with the network and operational changes (Perkins, 2013) and shortens the amount of time required to resolve problems with network applications, including slowdowns and abnormal activity (Steinberg, 2006). Implementing ITIL helps organizations provide information about their network performance to financial regulators by enabling increased internal coordination and standardization (Babcock, 2007).

More recently, the discourse around infrastructure has focused on cloud services. Practitioners perceive ITSM and other standard frameworks as necessary to help manage the problems that occur in cloud environments, maintain credibility, and drive efficiency and enable automation to achieve cost savings (Biddick, 2010). Practitioners indicate the importance of consolidating and starting to virtualize IT infrastructure while implementing ITSM to enhance cyber security and IT performance (Foley, 2009). They view the framework as key to successfully migrating to the cloud (Mitchell, 2010). They also expect recent developments such as new service platforms to provide greater clarity around cloud computing, such as about cost and other details of cloud purchases, which will further increase the demand for cloud computing services (Barrett, 2010).

While academics have explored the outcomes and benefits of implementing ITSM (i.e., improved service quality, customer satisfaction, improved department structure and coordination), little research has addressed how improvements in infrastructure help organizations achieve these benefits. Further, research has not described the impact that implementing ITSM has on an organization's infrastructure or cloud computing.

4.1.3 Finding 3: Role of Software

The practitioner literature often warns that IT departments interested in implementing ITSM may pay too much attention to software tools and place insufficient emphasis on processes. George Spaulding, Executive Consultant at Pink Elephant in Toronto, cautions against relying on support software immediately; he suggests that tools will only automate existing processes rather than defining new processes (Bender, 2014). Practitioners also suggest the necessity of knowing how to use software tools correctly (Connolly, 2014b) and of the difficulties of using tools to suit different needs (Meehan, 2002). William Snyder, an analyst at Meta Group in Stamford, further adds that, although organizations often buy tools to fix problems, they need to first understand the problem before questioning how tools can help fix them (Meehan, 2002).

When looking at the practitioner literature that discusses software's role, we also found a subtheme about how practitioners use gamification software to assist them when implementing ITSM. Given the difficulties associated with understanding the ITSM process, some practitioner publications have discussed integrating gamification into the learning process. Interactive and energetic software simulations exploring the main obstacles associated with ITSM implementation may help render ITIL interesting and understandable to its users (Thibodeau, 2007) by animating ITIL processes in realistic and fast-paced scenarios (Rossi, 2007). Practitioners propose that organizations that use gamified tools to promote ITSM may offer significant benefits over other educational experiences (e.g., staff members may more rapidly accept the new framework, may more quickly understand new concepts and terms, and may engage more with the implementation process and remain in their current roles) (Rossi, 2007).

Alternatively, no previous academic study from the journals or conferences included in our sample has investigated the effects of gamification in the ITSM field. Also, we found no academic research in our publication scope that examines the associated advantages and difficulties of relying on tools when implementing ITSM.

4.1.4 Finding 4: Regulation and Implementation of ITSM

Much of the earlier practitioner literature highlights the role of regulation in implementing ITSM. This literature is concentrated around the time of the introduction of the Sarbanes-Oxley Act (SOX) in 2002. Practitioners suggest that several organizations implemented ITSM based on the need to comply with regulations (Hildreth, 2005). Financial firms have been reported to spend vast amounts of money on IT systems and procedures to comply with regulatory requirements, such as SOX and Basel II/III, in efforts to increase the chances of deterring rogue trading (Nairn, 2008). The importance of regulation is not only constrained to the finance industry. John Montross, VP of telecommunication company Sprint's managed network operations, asserts that one of the reasons Sprint's customers support the implementation of ITIL is because it ensures processes are in line with government regulations (Babcock, 2007). Willa Fabian, IT Vice President at EARTHLINK, suggests that ITIL has resulted in vast improvements and helped the organization to meet around 70 percent of Sarbanes-Oxley requirements (Anthes, 2005a).

The impact of regulation in motivating organizations to implement ITSM is, however, less evident in the academic literature. In our full-text search, none of the academic papers we identified focus primarily on the topics "regulation" or "Sarbanes-Oxley" and similar key terms. While a few papers briefly mention regulation (Hochstein, Tamm, & Brenner, 2005; Pollard & Cater-Steel, 2009; Tan, Cater-Steel, & Toleman, 2009), they do little more than propose that organizations implement ITSM frameworks to comply with regulatory requirements. They provide no further details concerning these topics.

5 Discussion

We compared the academic and practitioner literatures on ITSM and found both several similarities and differences. In this section, we explore these topics to demonstrate how one could develop a research agenda to highlight any gaps that exist between the practitioner and academic literatures. A research agenda developed with our methodology could serve as a starting point for future researchers to know what to study to increase the relevance of their academic research for practitioners. We intend the research questions we propose to illustrate some of the research opportunities available to academics rather than completely and definitely list such opportunities. Nevertheless, this process may uncover issues relating to the extent of relevance of IS research for practitioners. We also examine how one may apply our findings to furthering research into IS frameworks more broadly.

In his research, Jarvinen (2000) develops a taxonomy to classify IS research and provides a useful way to develop research questions structured on the basis of this framework. Taxonomies are particularly useful in supporting an IS researcher by focusing research, clarifying how constructs are represented in the literature, and identifying research gaps or trends (Vogel & Wetherbe, 1984). In particular, in his taxonomy, Jarvinen differentiates between whether the research question refers to understanding what already exists or stresses the utility of a human-construct artefact. Empirical research can either test theory (i.e., apply theory or framework to understand a case study) or create theory (i.e., create an explanation, model, or theory to explain the investigated phenomenon) (Siponen, 2005). Alternatively, artefact-building approaches focus on developing an artefact, while artefact-evaluating approaches assess the effectiveness or usefulness of an artefact for its particular purpose (Jarvinen, 2000). Using this taxonomy, researchers can better understand how to develop a research agenda based on the topics they identify using our methodology. Thus, we also apply this taxonomy to our ITSM example. We first address how the identified topics have been discussed in other areas of IS to understand how research in ITSM could have explored them. We then provide three examples of possible research questions using the taxonomy that Jarvinen (2000) proposes. We group these research directions under conceptual-analytical, theory creating or testing, and artefact building or evaluating.

5.1 Co-implementation of Frameworks

The practitioner literature highlights the complementary nature of IT frameworks, while our findings suggest that the academic literature typically examines the implementation of only one framework, most commonly ITIL.

Cater-Steel et al. (2006) are among the few that have explored the co-implementation of ITSM with other frameworks. They call for further research in this area to evaluate co-implementation's cost-effectiveness and its effect on employee morale, productivity, and the implementation process. Further research could also elucidate the extent to which organizations in other countries co-implement ITSM frameworks. Our findings also indicate the importance of exploring other frameworks such as PRINCE2 and the ISO 27000 series because the practitioner articles we examined often mentioned them when they discussed ITSM.

In general, academic research on other aspects of the IS domain has explored the co-implementation of various IT frameworks. For example, studies have examined organizations that have co-implemented CMMI with such frameworks and standards as CoBIT (Alfaraj & Qin, 2011), quality function deployment (Sun & Liu, 2010), and ISO 9001 (Yoo et al., 2006). These studies suggest that co-implementation offers a way to strengthen areas that a single framework or standard does not cover. While CoBIT provides CMMI with a roadmap to implement and identify particular areas for process improvement (Alfaraj & Qin, 2011), CMMI offers ISO 9001-certified organizations with more detailed practices to continuously improve processes (Yoo et al., 2006). These conclusions provide evidence that co-implementation may serve to provide additional support and structure to singular frameworks because one framework may not be sufficient to address all corporate requirements.

In accordance with the practitioner literature, future academic research should highlight the motivations and benefits of implementing various ITSM frameworks. It would be of interest to understand how companies choose the most appropriate mix of frameworks for their requirements and which organizational factors lead to their deciding to co-implement different IT frameworks.

We suggest, therefore, that using our methodology could result in research questions such as:

- 1) How does co-implementing frameworks help strengthen areas that a single framework does not cover, such as business-IT alignment, knowledge management, organizational learning, outsourcing, and competitive advantage? (Conceptual analytical)
- 2) What theory can best reflect why different organizations consider strategic and technical factors when choosing to co-implement ITSM frameworks? (Theory creating)
- 3) Can one develop a model that indicates the most appropriate mix of ITSM frameworks based on an organization's specific requirements? (Artefacts building)

More generally, the results indicate that, for IS research to grow in relevance, academics who investigate IS frameworks should consider the possibility that organizations may already have in place several IS frameworks or may be concurrently implementing several different frameworks. Thus, researchers should not study IS frameworks in isolation. Future academic research on IS frameworks may also seek to

understand firms' motivations for and the benefits of co-implementing frameworks and which specific combinations of frameworks are most ideal.

5.2 Infrastructure Discourse

We found that the association between data centers and ITSM is more prominent in the practitioner literature than the academic literature. In further analyzing this discourse, we found that recent practitioner literature examines how ITSM can help organizations transition and operate in cloud computing environments.

Research into other IT frameworks has explored how cloud services affect the implementation of frameworks such as the ISO 27000 series (Doelitzscher, Reich, & Sulistio, 2010; Ristov, Gusev, & Kostoska, 2012) and CoBIT (Brender & Markov, 2013). These studies focus on explaining the risks involved in using cloud services and whether organizations have implemented appropriate mitigation practices. Marston, Li, Bandyopadhyay, Zhang, and Ghalsasi (2011) echo the findings of these studies and call for more research to investigate the development of security frameworks or guidelines when operating in a cloud environment.

Our findings show that we lack academic journal and conference papers that examine ITSM and the impact its implementation has on infrastructure and cloud services. Therefore, possible research areas in cloud services include:

- 1) Which ITSM processes, if any, contribute to the effective management of cloud services? (Conceptual analytical)
- 2) As organizations increase their reliance on cloud service providers, what is the impact on the benefits that they receive when implementing ITSM? (Artefacts evaluation)
- 3) How do ITSM frameworks help organizations implement cloud services? (Conceptual analytical)

As the potential for ITSM to assist with the movement towards cloud computing indicates, IS practitioners are also interested in the higher-order capabilities of IS frameworks. Thus, scholars should also focus on these high-level dynamic capabilities, which Eisenhardt and Martin (2000) define as those organizational processes that require resources to match and create market change. Dynamic capabilities are the organizational and strategic routines by which corporations integrate, obtain, and configure resources while markets evolve. These capabilities may include resource integration capability, resource configuration capability, learning capability, and the capability to respond effectively to rapidly changing business environments (Wu, 2006). Thus, practitioners consider not only final outcomes generated by frameworks important, on which the academic literature often concentrates, but also the processes by which the frameworks achieve these outcomes.

5.3 Role of Software

The practitioner literature tends to more commonly discuss the link between ITSM and software tools than the academic literature. Nevertheless, some academic research has examined the effectiveness of software for implementing IT frameworks such as CMMI, Six Sigma, and PRINCE2. For Six Sigma, researchers have noted software tools to encourage employee participation (Aboelimged, 2010; Buch & Tolentino, 2006; Larson, 2003) and to be a main reason for implementation success (Antony & Banuelas, 2002). In project management, studies have examined how using tools can result in project management effectiveness (Hyväri, 2006; Patanakul, lewwongcharoen, & Milosevic, 2010) and the level of satisfaction of organizations with the tools available to them (Hyväri, 2006; Payne, 1995). Research into CMMI examines tool effectiveness and usability (Rose, Pedersen, Hosbond, & Kræmmergaard, 2007) and whether software tools influence team productivity (Conte, Dunsmore, & Shen, 1986; Krishnan, Kriebel, Kekre, & Mukhopadhyay, 2000). Researchers who have examined ITSM may have found it useful to examine how software can increase the ease and effectiveness of implementation and subsequent use and managers', employees', and customers' satisfaction with the process.

Additionally, studies in ITSM have shown that appropriate staff training is one of the most important factors for successfully implementing ITSM (Drechsler, 2013; Wan & Jones, 2013). Our results indicate that organizations may use gamification to train staff in ITSM processes. Gamification participants can make mistakes without costly real-world consequences (Garris, Ahlers, & Driskell, 2002), which may encourage participation and learning through repetition. Further, gamification has the potential to create a

sense of achievement, provide immediate task feedback, increase user satisfaction, facilitate social interaction, enable problem solving, and support the overall learning process (Harman, Koohang, & Paliszkiwicz, 2014). Thus, ITSM academic research may have sought to contribute to this discussion by empirically exploring how gamification may enable improved staff training particularly in terms of content retention, engagement, and staff retention.

To better integrate the practitioner and academic literatures, topics in academic research should address how tools can engage staff and impact productivity when an organization implements ITSM. Research questions that help to address this concern could include:

- 1) How can an organization best use tools to support the implementation of ITSM? (Conceptual analytical)
- 2) Which kind of model could explain the benefits received due to the use of ITSM tools? (Theory creating)
- 3) How effectively does gamification help train staff in the ITSM processes—specifically as it concerns content retention and engagement and staff retention? (Artefacts evaluating)

More widely, research into IS frameworks should explore which and how tools are chosen and how practitioners use them to help support the phenomenon being studied. Research on IS frameworks may also seek to understand the benefits of using tools and how one may most appropriately introduce them to members of staff in a corporate setting. As our research indicates, such areas are of importance for practitioners.

5.4 Regulation and Implementation of ITSM

Firms face increasing pressure to comply with legal obligations (Li, Peters, Richardson, & Watson, 2012). At the same time, organizations often experience difficulties in implementing regulatory and legal requirements (Hu, Hart, & Cooke, 2007; Merhout & Havelka, 2008) and are wary of the high costs associated with compliance (Brown & Grant, 2005; Breaux & Antón, 2008). Nevertheless, businesses have begun to approach these regulations as a motivation for improving their business processes by correcting deficiencies in their information systems (Li et al., 2012).

We found that the practitioner literature regularly refers to the impact of regulations on the implementation of ITSM frameworks. However, academic literature on this topic is scarce. Nonetheless, the introduction of the Sarbanes-Oxley Act has had a significant impact on IT departments. As a result of SOX, corporations had to re-examine their corporate governance structures to ensure accountability towards stakeholders. Indeed, the large number of firms that introduced IT governance procedures during this period and their creating new CIO positions may evidence the SOX's influence on IT governance (Lunardi, Becker, Maçada, & Dolci, 2014), which signals a change in organizational IT and corporate strategy (Karanja & Zaveri, 2014).

We need future research to understand how regulations have influenced the adoption of ITSM frameworks and whether ITSM assists practitioners with their ability to comply with regulations. Future areas include:

- 1) What is the relationship between the types of regulations introduced and the ITSM organizations implement? (Conceptual analytical)
- 2) Which kind of model could explain how organizations implement ITSM due to the introduction of different regulations compared to other rationales for adoption? (Theory creating)
- 3) How effectively did SOX encourage organizations to pay closer attention to their IT governance?(Artefacts evaluating)

As the push to implement ITSM due to regulations such as SOX indicates, reasons for why organizations adopt IS frameworks continue to evolve. Thus, researchers should focus on how different organizational and regulatory requirements may dynamically affect the implementation of various IS frameworks over time.

5.5 Relevance in ITSM

In this paper, we implement a novel methodology to detect gaps in the literature. Using this methodology as a foundation, future researchers can examine more closely any misaligned topics and research gaps that the methodology highlights. We examine an area of IS that has been important in the past and continues to be relevant today, which one can see in the ITSM Forum's international membership. The

fact that this area is now less spoken about but still relevant for organizations provides an ideal example for applying our methodology because there is less potential for bias related to the time lag factor of publications in academic contexts. If we were to examine a field that researchers and/or practitioners were currently widely speaking about, scholarly works that potentially discuss the same topics as practitioners might simply still be in the process of being published, which could distort findings. As such, researchers can establish a more comprehensive understanding of whether practitioner relevance exists in IS or at least has existed in the recent past when the field published many papers that discuss practitioner relevance in IS. We show that the topics that academics and practitioners discuss in this field actually do align to a large degree and that academics have not fully discussed only a handful of topics. However, although this finding indicates that academic research may not be entirely irrelevant for practitioners, we also suggest that researchers should take steps to reduce the amount of time required to publish academic papers so that practitioners may benefit from their findings and possibly implement them efficiently in the quickly evolving and dynamic business environments they face.

We also note that the types of topics that academics and practitioners focus on may differ in that academics focus more on theoretical knowledge rather than on the application knowledge that practitioners typically care about (Kock et al., 2002). As Rosemann and Vessey (2008) state, the research community uses its own terminology and often reports on methodological aspects that are challenging for non-academics to understand. Academic research also often focuses on studying and discussing variables that are abstractions and generalizations while neglecting detailed considerations of the actors, actions, and artefacts used for these actions, which are more relevant for practitioners (Ramiller & Pentland, 2009). Indeed, our findings reflect as much.

6 Conclusion

In this paper, we develop a new methodology to help increase relevance of academic research for practitioners. We suggest that the practitioner literature provides details about practitioners' discussions, perspectives, and behaviors and that one can compare such details with the academic literature to identify areas of misalignment. Accordingly, our approach, which adopts a semantic entity annotator and keyword analysis, provides a systematic, comprehensive, and statistically significant way to uncover important misalignments between the two literatures. We suggest that we may treat these alignments as research gaps, which provides a solid foundation for future academic research that is more relevant to and better addresses the needs and interests of practitioners.

In applying our approach to the ITSM field, we found that, while still important for organizations, academic and practitioner publications no longer extensively debate and discuss the field. This slowdown in the debate allows one to better understand the extent of alignment between the topics that practitioners and academics discuss regarding ITSM. Unlike much of the existing literature, however, such as Baskerville and Myers (2009), we conclude that there exists extensive alignment between the literatures and, thus, that academic research is not entirely irrelevant to practitioners. Still, we do identify topics that the academic literature has discussed less despite appearing frequently in the practitioner literature.

By explaining in detail the steps involved in the process, we believe others may apply our approach to other fields both in and beyond IS. By providing awareness about what topics practitioners who work in a field care about, studies that use our approach may deliver foundations for subsequent academic research to understand how to close identified gaps. Researchers may also find other ways of identifying these relevant areas for research through interviewing practitioners and analyzing the programs of the numerous national ITSM conferences.

Our study has several limitations important limitations one should consider when interpreting our results. First, we had to restrict the study's scope to a certain number of practitioner publications and research papers. Although we decided to not include consulting literature as part of practitioner literature because existing studies delineate between these literatures, future research may wish to understand whether and to what extent our findings would differ if one included consultants' publications. Second, our findings are inherently limited by the effectiveness of TAGME as our entity annotator. As the effectiveness of the tool increases, so too will the results obtained through its use. The proposed methodology may also be limited by its focus on the abstracts of academic papers. Although we could also examine the sections in these papers that focus on the implications for practitioners, many papers do not clearly delineate such sections.

Nevertheless, by introducing an entity annotator and by applying a novel methodology, we are confident that our results represent a seminal work in the IS field. As such, our paper provides critical insights into

the misalignments that exist between the practitioner and academic literatures in the IS field. Such misalignments are particularly crucial for academics who seek to ensure that their research is practically relevant and contributes to the field's knowledge. We hope that such research will increase the level of alignment between a field's practitioners and academics.

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Appendix A: Prestigious Journals and Conferences (Iden & Eikebrokk, 2013)

1. *MIS Quarterly*
2. *Information Systems Research*
3. *Journal of Management Information Systems*
4. *European Journal of Information Systems*
5. *Information and Management*
6. *Journal of Information Technology*
7. *Decision Support Systems*
8. *Journal of the Association of Information Systems*
9. *Journal of Strategic Information Systems*
10. *INFORMS, Journal of Computing*
11. *Information and Organization*
12. *Annual review of Information Science and Technology*
13. *Journal of Global Information Management*
14. *Information and Software Technology*
15. *International Journal of Information Management*
16. *Information Systems Frontiers*
17. *Information Systems Journal*
18. *Journal of the American Society for Information Science and Technology*
19. *Journal of Information Science*
20. *Information Systems Management*
21. *Information Society*
22. *Information Technology and People*
23. *Journal of Computer Information Systems*
24. *Communications of the Association for Information Systems*
25. Americas Conference on Information Systems
26. European Conference on Information Systems
27. International Conference on Information Systems
28. Pacific Asia Conference on Information Systems
29. Hawaii International Conference on System Sciences

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