

# Application and practical considerations of the six-step process: An example from organizational communication

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## **Introduction**

To provide researchers in MOS with a detailed guideline on how to conduct a systematic review, in the following, each step is detailed with an application example from the field of organizational communication, developed earlier by the authors of this article. The way organizations build relationships with their stakeholders has strongly been affected by the digital communication environment (Boyd & Crawford, 2012). However, when studying these digital relationships, researchers still often relied on self-reported survey measures, rather than digital data points such as follower networks or behaviors. Thus, the relationship paradigm which is found in stakeholder theory (Griffin, 2017), marketing (Palmatier, Dant, Grewal, & Evans, 2006), and organizational communication along with public relations (Ki & Shin, 2015), had not yet received a digital update. To explicate digital organization-stakeholder relationships on a conceptual level (Chaffee, 1991), to identify their existing measurements (Stephens et al., 2017), and to outline the underlying normative assumptions, the systematic review asked: how are communicative online relationships between organizations and

stakeholders investigated (conceptualized, measured, and evaluated)? Given the specific focus on measurements of relationships included in the research question and the importance of empirical investigation for theory building, the systematic review focused on empirical articles.

### **Step 1: Extracting key concepts from the research question**

The research question “How are communicative online relationships between organizations and stakeholders investigated (conceptualized, measured, and evaluated)?” can be broken down into several widely used concepts: communicative relationship, stakeholder, organization, online, and investigate. The main challenge was to narrow these central concepts into searchable units. Both “investigate” and the terms it implied (conceptualize, measure, evaluate) soon appeared to be arduous because of their manifold meanings, and as such likely belonging to concepts that are not necessarily needed for searching. A similar issue was posed by “stakeholders,” which can be groups or people, or individuals, and can take a myriad of forms (Freeman, 1984). To capture all sorts of stakeholders, be they organizational or individual in nature, it was decided to have “stakeholders” implied/included in a broadened concept of communicative relationships, i.e. communicative relationships of organizations. This led in turn to a closer examination of the concept “communicative relationships.” Since the research interest was on the relationship between an organization and its stakeholders on digital communication platforms, rather than, say, on B2B buying interactions, the term “communicative” was thought to specify the nature of the relationship. Thus, finally the elements “communication of organizations” and “online” were identified to qualify the nature of the relationship, and as such fit to be translated into a search string. The whole process was underpinned by initial trial searches.

## **Step 2: Reporting and Documentation**

A *Google doc* logbook was set up at the start of the review process. Mutual feedback on the research question and search string was exchanged. The resulting adjustments of the search strings and of their results documented the extraction of key concepts from the research question and their translation into a search strategy. In addition, one author kept a text file with a research diary covering the entire process of the systematic review. After conducting the search, a second version of the logbook provided the full search strategy and the number of results for each database, and the retrieval date. The references were downloaded in RIS files, deduplicated in *RefWorks* and thereafter imported to *Rayyan*. Access to this database - and the final sample of included articles - is provided to interested researchers by the corresponding author.

## **Step 3: Translating concepts into search terms with the help of an appropriate database**

“Communication of organizations” and “online” had been identified as the concepts to be translated into a search string. The *PsycINFO*’s thesaurus - explored by using “*Advanced search*” and “*Map term to subject heading*” - was then instrumental to build a set of search terms aptly covering the two concepts. The keywords provided by the key articles and the subject headings they were labelled with by *PsycINFO* were used for this aim. “Social media”, for example, is both a keyword adopted by Romenti, Valentini, Murtarelli, & Meggiorin (2016) and a subject heading at *PsycINFO*. Accordingly, the thesaurus tree structure referred to alternative or additional headings which can be broader (“communications media”), narrower (“online social networks”) or related (“blog”) to “social media.” Then, a choice was made of which subject headings to use, and whether they needed to also be searched as free-text terms in the abstracts, titles and identifiers (i.e. keywords) fields. Free-text search is the only possible

option for all those terms (e.g. “twitter”) that do not have a subject heading in the thesaurus. The resulting search string construction underwent four rounds of going back-and-forth between research question, trial searches, and adaptations.

To supplement the above with terms yet excluded, seven key articles identified previously were processed with WordStat 8.0.11. The text was stemmed (Lovins algorithm) and processed for univariate frequency analysis. The 30 most frequent terms in all documents and the 30 most frequent terms per document (relative frequency per document by the tf/idf score) were examined. Nine out of the ten most frequent words over all documents were already included in the search string. From the TF/IDF matrix it appeared that specific concepts such as “dialogue” or “interactivity” were new. After examination of their definitions in the thesaurus, however, it was decided not to include them because they were already covered by other concepts. Further examination of terms showed that concepts were used interchangeably, such as “site” and “website.” Furthermore, word co-occurrences were examined along a word dendrogram and a multidimensional scaling map to identify which words were semantically close to others. This gave an indication for clustering search terms in the search string. This frequency-based text analysis procedure can also be conducted before the thesaurus-based conceptual approach is started to get an initial overview of the richness of terms related to the concepts of the research question.

#### **Step 4: Creating search strings, running the search and validation application example**

Figure 2 reproduces the complete *PsycINFO* search string set up by the authors for searching articles related to one of the key concepts of their research question, “online.” Following *PsycINFO*’s syntax, subject headings are recognizable by the front slash sign (*audiovisual communications media*/), while “ti.ab.id” indicates that each free-text term has

been searched for in the titles, abstracts, and identifiers. Truncations (*blog\**) and proximity operators (*social network\* adj3 (online OR site)*) have been used too, the latter apt to find the terms in any order with two or fewer words between them. The search string for “online” retrieved 110.299 results (Table 2). The search string for the other key concept, “communication of organizations”, similarly built, retrieved 2.225 hits. When combining the two search strings (“online” AND “communication of organizations”), a total of 299 titles resulted. While no language or publication date limits were applied, the dataset was restricted to peer-reviewed articles only, leading the global search strategy for *PsycINFO* to the final result of 237 hits.

audiovisual communications media/ OR  
 audiovisual.ti.ab.id. OR  
 avatar.ti.ab.id. OR  
 blog\*.ti.ab.id. OR  
 cell phones.ti.ab.id. OR  
 cellular phones/ OR  
 chat\*.ti.ab.id. OR  
 computer applications/ OR  
 computer based task\*.ti.ab.id. OR  
 computer mediated communication/ OR  
 computer searching/ OR  
 computer usage/ OR  
 digital computers/ OR  
 digital devices.ti.ab.id. OR  
 digital video/ OR  
 electronic mail.ti.ab.id. OR  
 email\*.ti.ab.id. OR  
 facebook.ti.ab.id. OR  
 google.ti.ab.id. OR  
 handheld\*.ti.ab.id. OR  
 human computer interaction/ OR  
 hypermedia/ OR  
 hypermedia.ti.ab.id. OR  
 information technology/ OR  
 internet/ OR  
 internet usage/ OR  
 iphone\*.ti.ab.id. OR  
 ipod\*.ti.ab.id. OR  
 laptop\*.ti.ab.id. OR  
 microcomputers/ OR  
 mobile devices/ OR  
 mobile devices.ti.ab.id. OR  
 mobile phones.ti.ab.id. OR  
 multimedia/ OR  
 multimedia.ti.ab.id. OR  
 nonprint media.ti.ab.id. OR  
 online social networks/ OR  
 online systems.ti.ab.id. OR  
 OSN\*.ti.ab.id. OR  
 second life.ti.ab.id. OR  
 smart device\*.ti.ab.id. OR  
 smart phone\*.ti.ab.id. OR  
 SNS\*.ti.ab.id. OR  
 social media/ OR  
 social media.ti.ab.id. OR  
 social networks/ OR  
 (social network\* adj3 (online OR site).ti.ab.id.) OR  
 tablet\*.ti.ab.id. OR  
 tagged.ti.ab.id. OR  
 text message\*.ti.ab.id. OR  
 texting.ti.ab.id. OR  
 twitter.ti.ab.id. OR  
 webcam\*.ti.ab.id. OR  
 website\*.ti.ab.id. OR  
 websites/ OR  
 youtube.ti.ab.id.

Figure 1. Search string for “online” following *PsycINFO*’s syntax.

### Step 5: Adapting the search syntax to other databases

Four databases were chosen for further developing the systematic review on organization-stakeholder relationships. Among those accessible via the researchers’ institution, *Business Source Premier* (hosted by Ebsco) covers most research in MOS and *Communication & Mass Media Complete* (Ebsco) focuses on communication and media studies, both of which are deemed most relevant regarding the research question. Since MOS also has a rich tradition

in sociological concepts and theories, and because the realm of public policy also includes a variety of organization and stakeholder interactions, *Sociological Abstracts* and *Worldwide Political Science Abstracts* (both hosted by *ProQuest*) were also selected. None of the four has a thesaurus comparable in structure with *PsycINFO*'s. After database selection, the key article were searched for in all four databases, to check whether they might provide additional, discipline-specific terms for describing the key concepts, and whether such terms might determine (minor) changes to the *PsycINFO* search strings. Thereafter, the *PsycINFO* search strings were adapted to the databases. The two *Ebsco* databases can be searched by abstract (AB), keywords (KW), subject (SU) and title (TI). The ProQuest databases similarly allow searches by abstract (AB), document title (TI) and all subjects and indexing (SU). The search syntax of all databases further accepts Booleans, adjacency/proximity operators and truncations.

A challenge was to balance between sensitivity and specificity. While *Business Source Premier*, because it includes trade and practitioners' literature, retrieved far too many hits (4,204), *Sociological Abstracts* and *Worldwide Political Science Abstracts*, because of their different terminological frame, retrieved too many irrelevant hits. To address this issue, trial searches were conducted adding a third search string, "measurement," to "communication of organizations" and "online." An addition of the "measurement" part of the search string to *PsycINFO* had previously appeared unnecessarily restrictive when weighed against the number of retrieved hits (i.e. sensitivity). Thus, "measurement" had not been translated into search terms for that database, and a similarly motivated decision could now be taken for *Communication & Mass Media Complete*. In the case of *Business Source Premier*, *Sociological Abstracts*, and *Worldwide Political Science Abstracts*, though, it was decided to accept this additional specificity bias to cope with the large amount of irrelevant hits. However, this was only decided after careful examination of the results that would be excluded by adding a search

string for “measurement.” “Measurement” was broadly formulated (measur\* OR evaluat\* OR analy\* OR assess\*) to increase sensitivity when searching the abstract, title, subject term and keyword fields of the three databases.

The full search strategy could finally be run with all the databases, including *PsycINFO*, whose extra search limit of peer-reviewed articles was applied also to the other four tools. Results were thereafter extracted with citation software and imported to Rayyan, while the definitive search strings were recorded in the review logbook.

Table 2 <i>Number of resulting hits per database (search conducted on July 12th, 2017)</i>					
Search string and limiter/ Database	Online	Communication of organizations	Measurement	Combined search	Peer-reviewed
<i>PsycINFO</i>	110,299	2,225	-	299	237
<i>Communication &amp; Mass Media Complete</i>	185,365	4,363	-	1,111	637
<i>Business Source Premier</i>	3,409,880	63,103	2,349,678	4,204	1,759
<i>Sociological Abstracts</i>	182,254	1,587	548,905	294	119



<i>Worldwide Political Science Abstracts</i>	82,307	1,222	295,251	172	77
SUM					2,829

**Step 6: Additional searching: citation tracking, hand search, grey literature, expert consultation**

Citation tracking was performed additionally. The set of 74 included articles resulting from the databases search was tracked in *Google Scholar* and *Web of Science*. Two additional articles were found and deemed relevant for inclusion in the data set. In addition, the authors hand-searched their own literature repositories including handbook chapters and books and tracked relevant citations, but no additional studies resulted. Grey literature was excluded from the systematic review as it was limited to peer-reviewed publications only.

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