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Word Clouds as a Community Development Tool: Promises and Pitfalls

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*Peer-reviewers were selected by another board member of Community Development Society for this manuscript to decrease potential bias or conflicts of interest.

Abstract

Word clouds are a data visualization technique that have been used for over a decade in a variety of different capacities. However, the utility of word clouds in a community development context has not been explored. This study is meant to provide insights into how professionals working in the field of community development view the use of word clouds. Online surveys from subject matter experts (SMEs) in the field were collected, and results were analyzed to answer three research questions: 1) How frequently do community development and evaluation professionals use word clouds in their work?, 2) How do community development professionals see word clouds used in their field?, and 3) What are the best practices in community development and evaluation in regards to word clouds? There was near parity in the utilization and non-utilization of word clouds in professional work, and the SMEs offered several promises and pitfalls associated with using this visualization method. This study is meant to encourage future utilization of word clouds in community development, and disseminate information about the best practices.
Introduction

Access to software for the generation of word clouds continues to grow, and there is no shortage of companies offering access to word cloud generating software. Word Clouds, Wordcul, Tagul, and ABCyia, all provide free services for the development of word clouds. Even online survey companies like Survey Monkey have them built into their analysis tools. Perhaps most famously, Wordle has quickly become one of the most widely utilized sources for word cloud visualization. Wordle, created in 2008, had 600,000 word clouds created within its first six months of operation, and the use of this website and other similar sites continues to grow (Viegas, Wattenberg, & Feinberg, 2009). Despite the numerous options for the development of word clouds, they are still a source of some disagreement among data visualization experts regarding their utility (Miley & Read, 2011).

With ever increasing access and utilization, word clouds have been used in a variety of contexts like education, journalism, and research. Despite the successful utilization of these tools in a variety of disciplines, there has been little attention given to the potential for word clouds in a community development context. In light of this context, the Community Development Society (CDS) promotes five Principles of Good Practice, which overall emphasize the need to engage and enhance the capacities of diverse communities and their members by also helping those members meaningfully make decisions about their communities (Community Development Society, n.d.). CDS’ revitalized journal, Community Development Practice, has aimed to showcase more tools to community development practitioners (e.g., Talmage, 2016; Talmage, Pstross, & Knopf, 2016), but do cloud visualizations merit being among those tools?

This article will focus on the two most common types of cloud visualizations: Word Clouds and Tag Clouds. Though these visualizations are similar, there is a distinction that can be made between the two constructs. The first distinction is seen in regards to how these visualizations are developed. Tag clouds generate their output based on labels, or tags, assigned to each item and that is why they are commonly used in social tagging and networking websites (Carmel, Uziel, Guy, Mass, & Roitman, 2012). On the other hand, a word cloud is created by selecting key terms from the item descriptions like websites or text files (e.g., .doc, .docx, .pages, .rtf, .txt) (Carmel, Uziel, Guy, Mass, & Roitman, 2012). Further, the orientation of tag clouds and word clouds differ. Most tag clouds arrange tags horizontally by lines and sort the tags alphabetically or according to frequency (Koh, Lee, Kim, & Seo, 2010). Word clouds, like the visualizations generated by Wordle, arrange words at different angles and orientations without much focus on alignment. This paper will focus primarily on the use of word clouds, and the promises and pitfalls associated with this particular data visualization technique.
Brief History of Word Clouds

Cloud visualizations, like word clouds and tag clouds, are not new concepts. The lineage of cloud visualizations can be traced back several decades. The roots of cloud visualizations began in Soviet Constructivism, and later in the work of Stanley Milgram (Viegas & Wattenberg, 2008). More recently cloud visualizations, specifically tag clouds, were used for data visualization on websites like Flickr, Delicious or Technorati (Cui, Wu, Liu, Wei, Zhou, & Qu, 2010; Rivadeneira, Gruen, Muller, & Millen 2007; Viegas & Wattenberg 2008). With these websites, word clouds function as aggregators of the activities being conducted by users (Viegas & Wattenberg 2008). These early forms of tag clouds enable users to place content within categories, or tags, which are freely chosen key-words meant to enable users to easily reference certain tags easily and quickly (Hassan-Montero & Herrero-Solana, 2006). As word clouds and tag clouds both have their roots in community-oriented websites, it seems logical that these types of tools could also be useful in the community development context.

There are numerous websites that enable users to create a variety of word clouds, with each utilizing proprietary algorithms to generate these visualizations. Although each site offers different functionality, there are some aspects of the software that are fundamental to word cloud generation. Broadly speaking, all word clouds depict the frequency of word usage. Word clouds provide a visual depiction of the frequency of words from any written material like: lecture notes, textbooks, or websites, and usually indicate frequency of usage with larger font sizes (Miley & Read 2011). The earliest tag clouds often listed the tags in alphabetical order, with the words varying in color and size (Hassan-Montero & Herrero-Solana 2006). Currently, word clouds offer a tremendous variety of layouts and shapes to improve the user experience.

Figure 1 shows an example of what a tag cloud downloaded from a google image search. However, there have been several developments in regards to the aesthetics of word clouds, and current software is capable of generating more sophisticated visualizations. The tools currently available offer users the ability to customize their word cloud visualizations including the ability to change typography, color, word orientation, and the general shape of the word cloud (Heimerl, Lohmann, Lange, & Ertl 2014). Figure 2 shows a more elaborate word cloud generated using Tagxedo to depict the responses to the question about word cloud best practices. Finally, Table 1 lists various websites that construct tag or word clouds, but this list is not all-inclusive.
Table 1
Tag and Word Cloud Websites

<table>
<thead>
<tr>
<th>Name</th>
<th>Weblink</th>
<th>Weblink</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABCYA</td>
<td><a href="http://www.abcya.com/word_clouds.htm">http://www.abcya.com/word_clouds.htm</a></td>
<td>Free</td>
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<td>GENERATOR BY JASON DAVIES</td>
<td><a href="https://www.jasondavies.com/wordcloud/">https://www.jasondavies.com/wordcloud/</a></td>
<td>Free</td>
</tr>
<tr>
<td>TAG CROWD</td>
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<td>Free</td>
</tr>
<tr>
<td>TAGXEDO</td>
<td><a href="https://wordart.com/">https://wordart.com/</a></td>
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<td>VOCABGRABBER</td>
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<td>Free</td>
</tr>
<tr>
<td>WORD MOSAIC</td>
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<td>Free</td>
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<tr>
<td>WORD SIFT</td>
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<td>Free</td>
</tr>
<tr>
<td>WORDCLOUD.COM</td>
<td><a href="http://www.wordclouds.com/">http://www.wordclouds.com/</a></td>
<td>Free</td>
</tr>
</tbody>
</table>
The Promises of Word Clouds for CD

In community development, disseminating data back to community partners can be a critical step for engaging the community and ensuring sustainable action. This dissemination does however pose a unique challenge, as community members who may benefit from these data may have varying degrees of data literacy. Therefore, it is important that the data be presented in a digestible way to the intended audience. This is one potential advantage of word clouds, as they create a simple visual image that is easily understood and enables the viewer to focus and reflect on the materials being presented (Miley & Read, 2011).

Word clouds have put complex information visualization research in the hands of non-expert users and enabled the creation of own artistic interpretations of a variety of data sources (Ramsden & Bate, 2008). Further, word clouds provide graphical representations of knowledge that enable viewers to form quick interpretations of high-level data without information overload (DePaolo & Wilkinson, 2014). The ability to create visually pleasing, and user friendly, data visualizations could be an extremely useful tool for community development. Further, beyond the accessibility of word clouds and ease of use, there are other potential advantages which can be drawn from the usage of word clouds in education and research activities.

Multiple studies have examined the impact and uses of word clouds in an educational setting, with many showing promising results. One study conducted by Miley & Read (2011) had undergraduate accounting students create word clouds as a study tool to help them remain abreast of developments in the business landscape. Those in the study indicated they not only enjoyed word clouds, but were also able to adapt the tool to fit their own learning style. The research by Miley and Read (2011) suggests that word clouds are a useful supplement for other learning tools and can help students prepare for examinations. The flexibility of word clouds to adapt to a variety of learning styles could be potentially useful in a community setting as those participating in community development research often represent diverse populations with differing learning needs.

The use of word clouds in an educational setting could offer some potential insights into how these visualization tools might be useful in a community development context. Word clouds are also a useful tool in examining key ideas from open-ended questions (DePaolo & Wilkinson, 2014), and as qualitative data is often used in community development research it could be a useful tool in understanding important themes (Williams, Parkes, & Davies, 2013). Although seemingly unrelated to community development, the use of word clouds as an educational aid does provide some insight into how this tool may be used in that field. Word clouds could facilitate in the illumination of some community level experiences, illustrate key ideas brought forward by the community, and afford researchers the ability to recap findings to community members.

In addition to educational settings, word clouds have also been utilized in a research capacity, which is potentially important for those working in community development. One way word clouds have proven useful in the research process is in the analysis of qualitative data of transcribed or spoken text (McNaught & Lam, 2010). In qualitative data, it is very important to identify key themes and ideas which exist in the data, and McNaught & Lam (2010) directly identified word clouds as a useful tool in extracting themes from written or transcribed text. Further, word clouds have been identified as a useful tool for preliminary data analysis, and a means to quickly highlight important ideas (McNaught & Lam 2010).

However, there are multiple uses for word clouds in research beyond preliminary analysis, which have implications for community development work. Word clouds serve as a useful tool in the analysis of focus group data, a common research method in community development, and greatly facilitate the process of result coding. Using word clouds enables researchers to hone in on the important ideas brought forward during focus groups and enable quicker and easier coding as researchers would be aware of the most common words (McNaught & Lam, 2010). Further, McNaught & Lam (2010) identified word clouds as a tool for providing outlines of data and as a tool for validating previous findings.

Finally, Rivadeneira, Gruen, Muller, and Millen (2007) identified several potential uses for word clouds, which may be useful in data dissemination activities associated with community development research. The uses identified by Rivadeneira, Gruen, Muller, and Millen (2007) are: Locating specific terms or concepts of interest (search), looking through a broad array of ideas (browsing), formulating impressions of the data (impression formation), and recognizing information or entities based on the word clouds (matching). All of these uses enable users to make a quick interpretation of potentially complexed data, which would be beneficial in community development research.
Despite the numerous promising uses for word clouds, there are also several potential issues with this type of data visualization. First, existing word cloud generation software is unable to take the input into context, and therefore may misrepresent what the original sentiment of the data (Williams, Parkes, & Davies, 2013). For example, an individual may describe something as “not great”, but the word cloud software only recognizes the frequency and not the original meaning of the statement, thus making potential invalidating the output. Worse yet, by analyzing the statements out of context this could potentially create misleading visualizations (Harris, 2011). Additionally, it is almost impossible to trace the words used in the generation of word clouds back to their original statement, making it difficult to determine the actual opinions of those terms in the word clouds (Williams, Parkes, & Davies, 2013).

While some word cloud generating software offers editing functionality, it can be somewhat limited. While it may be possible to have the software ignore common words such as conjunctions and prepositions, it is difficult to delete nouns, verbs, adjectives, or adverbs without going to the data source (Miley & Read 2011). Additionally, the structure of word clouds can make it challenging to compare words. Words of a similar size are difficult to compare, and longer words can appear more prominent, so word length can be conflated with importance. Also, frequency does not always equate to importance. Finally, the accuracy of the word cloud is contingent on the data being input into the software, and it is therefore important to have direct text from participants as opposed to researchers summaries as that would impact the word cloud output (McNaught & Lam 2010). As transcription services can be costly and time consuming, this could be a potential hurdle to accurately representing qualitative data like interviews and focus groups using word clouds for those working in community development.

The purpose of this study is to gain a more thorough understanding of how word clouds are currently being used in community development and evaluation work. Additionally, this study will explore best practices and methods currently being utilized in data dissemination in community development using word clouds. Currently, there is no literature on the utilization of word clouds in community development and evaluation work. The paucity of research on this topic represents a missed opportunity to examine an innovative data visualization technique in a field where it could be extremely useful.

This study will attempt to answer a series of research questions about word clouds in community development and evaluation work. The study questions are:

1. How frequently do community development and evaluation professionals use word clouds in their work;
2. How do community development professionals see word clouds used in their field; and,
3. What are the best practices in community development and evaluation in regards to word clouds?
Methods

To help answer the research questions associated with this study, a brief survey was developed about word clouds in community development and evaluation. The survey was designed for subject matter experts (SMEs) working in the community development field, and aimed to gain insights about how word cloud visualization methods were being utilized in community development. The survey consisted of one dichotomous question to determine if the survey participant had ever used word clouds, as well as four five-point Likert-type scale questions that were used to assess a variety of other opinions about word clouds. Finally, eight open-ended questions were asked to gather more qualitative insights about word cloud visualizations. The survey was uploaded to Qualtrics Survey Software, and all responses were completely anonymous.

The survey instrument and consent letter all received Institutional Review Board approval prior to distribution.

This study used a convenience sampling methodology in an effort to reach community development professionals. Links to the online survey were distributed via Facebook and email to a variety of community development organizations including Community Development Society, International Association for Community Development, and numerous others. A detailed list of distribution channels for the Word Cloud survey are shown in Table 2. These organizations were chosen as they are large networks of individuals working in the community development field and ensured a large number of individuals had access to the survey. There were a total of n = 25 SMEs who completed the survey.

Table 2
Distribution Channels for Word Cloud Survey

<table>
<thead>
<tr>
<th>Organization</th>
<th>Weblink</th>
</tr>
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<tbody>
<tr>
<td>COMMUNITY DEVELOPMENT SOCIETY</td>
<td>Facebook and Email</td>
</tr>
<tr>
<td>INTERNATIONAL ASSOCIATION FOR COMMUNITY DEVELOPMENT</td>
<td>Facebook</td>
</tr>
<tr>
<td>ASSOCIATION FOR RESEARCH ON NONPROFIT ORGANIZATIONS AND VOLUNTARY ACTION</td>
<td>Facebook</td>
</tr>
<tr>
<td>AMERICAN EVALUATION ASSOCIATION</td>
<td>Facebook</td>
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<tr>
<td>ARIZONA EVALUATION NETWORK</td>
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</table>
**Results**

Research Question 1: How frequently do community development and evaluation professionals use word clouds in their work?

The survey instrument developed for this study had multiple questions designed to capture the frequency with which, and reasons why, community developers utilize word clouds. There was near parity in the number of SMEs who had previously used word clouds, and those who had not. This was beneficial, as the study was able to incorporate the perspectives of those individuals who had not utilized the word cloud visualization method.

The first question on the survey asked ‘Have you ever used Word Clouds in your work?’ This was a dichotomous question with the only responses being yes and no. Only a slight majority of the participants (56%) stated, Yes, they had used the word clouds, and the remaining (44%) said, No, they had not. Later questions would expand on the frequency with which those individuals who had used word clouds currently utilize them.

Although not directly related to the frequency of use, participants were also asked to ‘Describe your reasons for using word clouds’. This was an open-ended question, and 16 individuals provided responses. The most common reason cited for using word clouds was as a technique to visualize data. Participants elaborated that word clouds were an excellent way to visualize qualitative data. Other survey respondents shared they used word clouds with data from surveys, interviews, and focus groups. Participants also indicated that they used word clouds in presentations, report writing, and in-course instruction. Further, participants described word clouds as a method for engaging communities with one participant explaining: “Such visualizations help to incite interest in and engagement with data...” Additionally, participants expressed that word clouds were a useful way to review inputs from evaluations. Multiple participants explained they had never used, or preferred not to use word clouds. One individual who preferred not using word clouds stating: “I don’t believe they’re an effective tool for conveying my work;” however, the individual provided no justifying reason.

Participants were also asked ‘How frequently have you used word clouds in evaluation reports?’ This question utilized a Likert-type scale with the answers: Always, Very often, Sometimes, Rarely, and Never. No survey participants indicated they Always used word clouds, and only 8% shared they used word clouds Very Often. More participants, 20%, stated they used word clouds Sometimes, and 16% said they used word clouds Rarely. The majority of participants, 56%, said they Never used word clouds in evaluation reports.

The next question asked participants ‘How have community members/clients responded to your use of word clouds?’ This question also used a Likert-type scale with the answers: Very favorably, Favorably, Neutral, Unfavorably, and Very unfavorably. The majority of participants, 52.9%, indicated that the community members responded Favorably, 11.8% indicated the community responded Very favorably, and 35.3% indicated that the community was Neutral. No respondents indicated that the community responded Very unfavorably or Unfavorably.

Further, participants were asked to answer ‘How likely are you to use word clouds in your future work?’. This question also used a Likert-type scale, with responses: Extremely likely, Somewhat likely, Neither likely nor unlikely, Somewhat unlikely, and Extremely unlikely. The majority of those participants who answered this question, 56%, indicated they were Somewhat likely and an additional 20% said they were Extremely likely to recommend using word clouds. An additional 12% of participants stated they were Neither likely nor unlikely or Somewhat unlikely to use word clouds in the future.

Participants expressed low utilization of word clouds in evaluation reports, with 56.0% stating they never use them. Despite the low utilization of word clouds in evaluation reports, those who had used word clouds indicated that they were met positively by clients, with 52.9% stating they were met favorably by clients. The majority of participants, 56.0%, stated they were Somewhat likely to use word clouds in their future work. Further, 54.2% of participants expressed that they were Somewhat likely to recommend word clouds to others working in community development. The results from these questions indicate that although there is not widespread utilization of word clouds, there are positive perceptions by both those working in community development and community members/clients. This could indicate the potential for increased utilization of word clouds with community development professionals.
Research Question 2: How do community development professionals see word clouds being used in the field?

The SMEs were asked ‘What role(s) (if any) do you see word clouds playing in helping community development efforts?’. This was an open-ended question meant to generate insights about the potential use of word clouds in community development, and participants had several suggestions for how word clouds could be used in community development efforts. Participants saw word clouds as a method for engaging communities. Those individuals espousing this point explained that word clouds are an effective method to elicit participation, and a useful tool for explaining values or visions. They also pointed out that word clouds help community members see the ideas of others around them and determine where their ideas overlap and understand the perspectives of others. One participant indicated they like to encourage community members to create their own word clouds for these comparison exercises.

It was also explained that word clouds could be a useful method for presenting information back to communities. A few participants again pointed to word clouds as an interesting method for visualizing qualitative data. Some saw word clouds as a source of inspiration for community members, and an easy way to provide emphasis to ideas brought forward in community inquiry. Others saw word clouds as a useful way to graphically represent community ideas. The SMEs viewed word clouds as a method for presenting data that was easily understood. The accessibility of word clouds is something that stood out to several individuals, as they enabled community members to easily recognize and understand findings. It was also seen as a means to elicit public and academic discussion.

Further, participants saw word clouds as a useful tool to help identify themes from community inquiry. Those completing the survey also explained word clouds are a helpful tool for presenting the key themes expressed by community members into reports, posters, presentations, and infographics. This was seen as particularly useful when a researcher returns to a community to present the findings of a needs assessment.

Another question asked ‘Why should community development professionals utilize (or not utilize) word clouds in their work?’ This was another open-ended question, and generated similar results as the previous questions. Participants recognized the utility of word clouds in visualizing data, identifying themes, and as being accessible and easily understood data visualization tool. However, beyond these key themes, participants also highlighted the attractiveness of word clouds. Further, multiple individuals identified word clouds as a “fun” method for visualizing data. Participants also stated that word clouds should be utilized as a tool for inspiring communities. They noted that word clouds also help community members and leaders focus on the meaning and purpose of their work.

There were also several reasons brought forward as to why some individuals do not use word clouds in their work. The most common explanation for not utilizing word clouds was because the lack of context. With one individual saying: “...But without context, sharing a word cloud form clients doesn’t communicate much...” One individual pointed out that while visually appealing, they do not communicate “specific impacts”. Finally, one individual pointed out “I am not a fan - it’s just a way to make quantitative data (frequency of words) look seemingly qualitative.”

Participants also offered several specific opinions about when and when not to use word clouds. It was explained that: “Useful for general use, may not be appropriate for formal evaluation reports unless the methodology is made clear”. Further, one participant cautioned that word clouds should not merely be used as a way to fill space, and explained the importance of providing an explanation to accompany the word cloud. Additionally, one individual pointed out that the literacy level of the intended audience should be considered when determining if word clouds are an appropriate methodology.

Additionally, SMEs were asked ‘How likely are you to recommend using word clouds to others who work in community development?’. This question used a Likert-type scale with the answers Extremely likely, Somewhat likely, Neither likely nor unlikely, Somewhat unlikely, and Extremely unlikely. The majority of participants, 54.2%, stated they were Somewhat likely, and 20.8% stated they were Extremely likely to recommend word clouds to others. Fewer individuals, 12%, stated they were Neither likely nor unlikely or Somewhat unlikely to recommend word clouds. Finally, 4.2% of participants stated they were Extremely unlikely to recommend.

There were several reasons participants identified for using word clouds in their work. Word clouds were brought forward as a method for engaging communities, presenting data to communities, and tool for identifying major themes in data. They were identified as a useful method for presenting research findings to communities and as a tool to stimulate conversation. Though many identified word clouds as a useful tool, there were also some concerns expressed about this visualization technique. Several individuals indicated that the lack of context associated with word clouds is a major shortcoming for the tool. It was also explained that word clouds may not be an appropriate tool for formal evaluation report writing, especially if the source data is not included. Additionally, when participants were asked if they would recommend word clouds the majority, 54.2%, said it was Somewhat likely.
that they would. The results from these questions indicate that there are several major reasons for utilizing word clouds in the community development context, but there are still some concerns with the visualization technique. Despite these concerns, over half of participants stated they would most recommend word clouds.

potential for increased utilization of word clouds with community development professionals.

Research Question 3: What are the best practices in community development and evaluation in regards to word clouds?

The next set of questions were meant to determine the current best practices for using word clouds in community development. The first directly asking ‘Please suggest some best practices for using word clouds in community development work.’ This was an open-ended question, and SMEs provided several ideas for how word clouds can best be utilized. They offered technical tips, reporting suggestions, as well as suggestions for how to format the word cloud inputs.

Participants offered several specific technical tips for using word clouds. There were multiple suggestions for removing some words from the visualization including articles (a, the, etc.) as well as other common or irrelevant words. Additionally, participants offered several stylistic suggestions for word clouds usage. It was suggested that word clouds should not be overused, and if they are used, it is important to ensure that they are large and dark enough to be interpreted. Participants provided additional suggestions for how to color word clouds, and it was suggested that a color scheme be selected that works to highlight the data. Another individual suggested the colors should be determined based on the audience.

SMEs also provided best practices for when and how to use word clouds in reporting. One SME suggested that word clouds be used as a method to illustrate issues to the community, specifically when analyzing social media data or stakeholder discussions. In the same theme, it was suggested that word clouds be used as a tool for brainstorming and conducting visioning sessions to help ease tense community discussions. One participant also pointed out that word clouds are a useful tool for pulling out themes in qualitative data.

Survey participants also had several points of caution for using word clouds. It was explained that word clouds should be seen as a snapshot, and not used to draw hard conclusions. It was once again emphasized that word clouds should have a purpose, and not be used as a means of filling space. Further, it was pointed out that an explanation is necessary to explain what a word cloud is and how frequency is determined when using word clouds in reporting. One participant went further with this idea and stated that when reporting the source tables used to create the word clouds should be included.

There were also several suggestions for how to handle the inputs that go into the development of word clouds. One participant suggested that short open ended responses were the best questions for word cloud development. The method of data collection was also indicated to be an important aspect of developing word clouds, as data should be systematically and rigorously collected. It was further pointed out that the development of survey questions used in the creation of word clouds should be thought out and inspire some type of action. SMEs also explained that the community should have input in the development of word clouds. Participants also cautioned that the relative size of the word could overstate its importance when depicted in a word cloud.

When asked ‘Which website do you generally use to create word clouds?’ the most common responses were Wordle and Tagxedo. NVivo and Infogram were also mentioned as software used to develop word clouds, though less frequently. When participants were asked why they used a particular word cloud software, the free price and ease of use were the only rational given.
Discussion

The purpose of this study was to explore the utility of word cloud visualizations in the context of community development. Though many of the findings indicated positive implications for the use of word clouds, there were also several reservations associated with using this data visualization method. For that reason it is necessary to explore both the promises and pitfalls associated with using word clouds. In regards to the promises, a model was developed to help future community developers determine if word clouds would be an effective tool for their purposes. The pitfalls identified from the literature and survey findings will provide community developers enough information necessary to determine the appropriateness and approach for using word clouds.

Promises of Word Clouds

Those individuals working in the field of community development are constantly striving for ways to engage community members in the research process, and there were several ideas brought forward by survey participants relevant to this point. Multiple survey participants corroborated previous findings that identified word clouds as a useful tool for disseminating research findings (Miley & Read, 2011; Ramsden & Bate, 2008; DePaolo & Wilkinson, 2014). Participants went further with these ideas and identified word clouds as a useful tool for stimulating conversations in the community. Word clouds were also identified as a useful method for helping community members come to a consensus about community issues. These findings have major implications for those individuals working in community development. Those individuals that have used word clouds held generally positive attitudes about future utilization, as well as positive beliefs about the perceived satisfaction of community members. The ability to stimulate conversation and help reach a consensus in the community make word clouds a valuable tool for individuals working in community development.

It is important for those individuals working in community development to produce reports and presentations that are useful for the communities in which they work, as community members are an important audience. The SMEs identified word clouds as a useful tool for supplementing reports and presentations, and thus engaging members of the community. Multiple reasons were identified as to why word clouds are useful in report writing and presentations, but one frequently cited reason was the ease with which they are understood. Being easy to understand is important for those individuals working in community development, as the levels of education and literacy can vary greatly in different communities. Further, word clouds were described as being useful for the simplification of complex qualitative data. Word clouds by design identify the most frequently used words, which can help those individuals in the community understand important qualitative findings. The simplification of complex data has numerous implications for those working in community development. By incorporating visualizations that are easily understood, it can further foster the engagement of individuals in the community.

While working in communities, being able to present data in a quick and meaningful way can be important for community engagement. Community partners may not have time to engage and understand all relevant data collected in association with a project, and it is important to quickly engage relevant parties, and provide them with information. As discussed by DePaolo & Wilkinson (2014) word clouds enable viewers to form quick interpretations of data without information overload, an idea confirmed by this study's findings. Participants described word clouds as a quick information summary, appropriate for a variety of audiences. Further, word clouds were described by multiple participants as visually pleasing and attractive. The attractiveness of this word clouds can help draw in the attention of community members, or other audiences, and further engage them with data. Being able to quickly convey salient information to community members in a visually pleasing manner, is an important objective for community developers, and word clouds could be a useful tool towards this end. Figure 3 outlines some of the several promises associated with the use of word clouds.

Figure 3
Promises of Word Clouds

![Visualize Data](image)
Pitfalls of Word Clouds

While those individuals participating in the study had numerous positive opinions about the use of word clouds, they also identified several potential pitfalls of word clouds which could have implications for community development professionals. One major pitfall associated with word clouds, illustrated in the literature and corroborated by survey findings, is in connection to the lack of context associated with this visualization technique (Williams, Parkes, & Davies, 2013). This is true in regards to the lack of context within the data, i.e. misinterpreting the actual meaning, and the broader community context from which the data was collected. By failing to address the issue of context in the use of word clouds, there is the potential to disseminate inaccurate information (Harris, 2011), and potentially mislead community partners. Providing inaccurate information to communities may potentially undermine the research objectives, and alienate potential research partners. It is therefore important for all those individuals involved in community development to use caution in utilizing word clouds, and take steps, outlined in the next section, to ensure the information disseminated is accurate.

Survey participants identified several other potential pitfalls which have implications for those working in community development. Though word clouds were identified as a useful tool for providing a quick snapshot, it is not useful for drawing hard conclusions. Expanding on this point, multiple survey participants indicated that word clouds are not sufficient as a stand alone reporting technique, and necessitate an explanation and supporting information. These points emphasize word clouds as a supplemental tool for data dissemination, not a tool to be used in isolation of other data explanations and visualizations. By recognizing the limitations as well as the utility of word clouds, those working in community development to disseminate data to community members and partners in the most effective and meaningful way.

Practice Tips

Researchers and practitioners now knowing what is out there about word clouds can benefit from the following tips below. This is not an comprehensive list, but it captures the findings of this study and previous work in the area. This list should be updated and revised in future publications.

1. Remember that word clouds are useful tools for data organization and visualization, but should not substitute for data analysis.
2. Remember that word clouds do not capture the meaning of the individual words.
3. Realize that the length of word can be conflated with importance.
4. Realize that words with similar sizes are difficult to compare.
5. Recognize that word clouds input may lack context, and the meaning of statement can be lost when looking at the individual components.
6. Consider that the questions used to generate the word cloud input need to be carefully crafted to provide meaningful results.
7. Realize that word clouds may not be appropriate for formal report writing, despite their visual appeal.
8. Recognize that word clouds should not be used as a means to fill space in a report and necessitate an explanation of what they visualize.
9. Consider that the creation of word clouds may necessitate some previous knowledge and experimentation with the software.
10. Recognize that data used in word cloud generation should be taken directly from participants, and not from the notes of observers.

Conclusion

This article provided a look into the use of word clouds in community development research and practice. Word clouds do have utility for researchers and practitioners alike as a data visualization tool. Perhaps most importantly, word clouds provide an easy to understand and accessible form of data visualization that allows community development professionals to better work and communicate with the citizens they serve. While word clouds may not replace current tools for data visualization, they are a community development tool that can complement and supplement any current efforts utilizing qualitative data in community development work. The hope of this study is that the lessons learned from this study provide guidance for their future use in communities.
References


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