Abstract—Tag clouds are a text-based visual depiction of tags (or words), typically used to display the relative tag frequency, popularity, or importance by font size. They can also serve as a visual summary of document content. In the last decade, tag clouds have proliferated over the web. They are now a common visualization in news sites for displaying the most active news story themes, photo sharing sites for conveying the distribution of image content, and social book marking sites for showing popular tags. In fact, several online programs are available that help you create your own tag clouds from different types of text sources. Tag clouds can evolve as the associated data source changes over time. Other sources of highly dynamic content include online news and photo-sharing sites which serve freshly uploaded and tagged material every day. Interesting discussions around tag clouds often include a series of tag clouds and consider how they evolve over time. However, while tag clouds seem to invite exposure of their evolution over time, they do not explicitly represent them. This result in a significant cognitive demand on people who want to understand how a tag cloud evolved. This paper aims to propose a model to study the importance of stability and to assess the compromise between stability and visual clutter.

Index Terms—Tag Clouds, Trend Visualization, Multiple Line Graphs, Stacked Bar Charts.

I. INTRODUCTION

Mostly, after evolution of web design on the Internet, the visualization of text, images, multimedia grows popularly around the world. Mostly, visualization concept fall in many categories such as highlighting currently news, new story themes [2], photo sharing sites for conveying distribution of sites of image tags[3], and social book marking sites for showing popular tags[4]. Among these visualization, Tag clouds is one of the research challenge to the user perspective elements. Tag clouds are text-based visual depiction of tags, typically used to show importance of tag frequency based on font size. There are different websites available to create new tag clouds from different types of text? Tag clouds can evolve from various data source changes over time. For example, a president speech on a particular concept of various places that shows the style of speech based on popularity, frequency and trends in the usage of words [14]. We can also evaluate tag clouds in the letters written by speeches.

In this paper, we introduce Spark clouds with grid view mechanism to know the cognitive demand of users among different types of mechanism like spark clouds [1] multi line graphs, stacked bar charts [16] and Parallel tag clouds [17]. The above specified mechanisms are inefficient as per cognitive demands of users. The paper is organized as follows. In 2nd section, we outline the related work on the tag clouds and their mechanisms to compare multiple tag clouds. In section 3, we describe spark cloud, spark cloud with grid view and comparison between them. In the next section 4, we consider design of spark clouds using grid view. The section 5 shows the results and the last section 6 concludes the paper.

II. RELATED WORK

The idea of Tag clouds have been came to existence in 1976 with the experiment done on a collective mental map of Paris by Stanley Milgram [6]. In 1977, search Refereral Zietgjest was created by Jim Flanergan as a way to visualize the number of times a term was used to find a given website by font size. From the origin of Tag clouds, many researchers explored various properties and mechanism on Tag cloud. Several website enable people to create their own Tag clouds from different types of text sources [9][10][11][12]. Kaser and Leimeir organized in the nested tables for HTML Websites by using Electronic Design Automation [EDA] packing algorithm [8]. In this, it will be applicable for the basic HTML websites but unable to incorporate the cascading style sheet information and it does not exist any trends like comparing Tag clouds across over time.

Seifert et al. proposed a new algorithm to address several layouts [13]. It creates compact and clear layouts by reducing white space and fee arbitrary convex polygons to bind the terms. Mostly researchers are concentrated on the utility of Tag clouds to achieve the future predictions. So, researchers classify the future predictions based on two categories. That is, those who are interested on features of Tag clouds and those who are interested on different layouts for Tag cloud comparison.

Bateman et al. compared nine visual properties of Tag clouds, these effects on visual search for Tag [5]. Their results show that font size and font weight have stronger effects than other such as colour intensity, number of characters of tag area. Cloudalicious is an online tool specifically designed to visualize how Tag clouds develop over time [7] from a given website. It downloads the tagged data from delicious [3] and then graphs the collective users tagged activities over time using multiple line graphs. From this tool we notified that it will suffer from overlapping lines and does not retain the visual appearance of Tag clouds. To convey the change across multiple Tag cloud Bong shine lee [1] developed Spark clouds using Spark line, it is high flexibility in the use of space and also it achieves more readability but not visibility of Tag clouds. Here invisibility appearances which comparing across multiple Tag cloud make arise a chance of inconsistency of analyzing the important information in the Tag clouds.
III. COMPARISON BETWEEN SPARK CLOUD AND SPARK CLOUD WITH GRID VIEW

Spark clouds depict the usage frequency of the tag over time and consistency in representation is maintained. To achieve this vertical axis of spark lines [15] does not encode the raw popularity of tags, but using linear transformation function based on the frequent usage of the tag. Spark cloud with Grid view depicts the frequency of the tag over time by representing the vertical axis of spark lines and encodes the popularity of the tags using linear transformation but by using Grid view, the word and the tag cloud related to one word will be placed in a Grid, thus showing the clear difference between one tag cloud and the other tag cloud. Thus it makes the tag clouds appear without ambiguity.

IV. DESIGNING SPARK CLOUD USING GRID VIEW

The basic idea of using grid view mechanism in Spark cloud to achieve the advantages of Tag clouds while incorporating minimal but sufficient indication of trends

V. EXPERIMENTAL RESULTS

Fig. 1: Existing system view of Tag clouds
The experimental results carried out in existing system and proposed system as shown in Fig. 1 & Fig. 2. To evaluate these experimental results, some of the constraints are considered and are discussed in this section.

Mostly to evaluate a Tag cloud, we choose font size as a criteria, this font size depends on two factors:
1. More number of occurrence of a tag cloud.
2. Less number of occurrence of a tag cloud.

For larger number of occurrences a scaling factor is considered which is described as follows:

\[ S_t = \frac{f_{\max} (t - t_{\min})}{t_{\max} - t_{\min}} \]

Where \( S_t \) is the font size after scaling, \( f_{\max} \) is the maximum font size, \( t_{\min} \) and \( t_{\max} \) represent minimum and maximum count based on instances of time and \( t \) is the count. The above equation is applicable for large number of occurrences of tag clouds. The same equation is applicable for the small number of occurrences of tag clouds. In this we considered that for every \( t_n \), the \( S_t=1 \) when \( t \) is less than \( \min \).

By using the above considerations the existing system and proposed system have been developed but in existing system the visibility of tag cloud is not better than the visibility of tag clouds in the proposed system. In this proposed one, concentrated on grid layout and noticed the differentiation between each tag cloud across the layout of grid view. These experiments are carried out on popular websites to know the importance of website under the web world.

The results were being tested using the following sample inputs to the system. The inputs are given in the Table 1. The following graph in the Figure 3 shows the frequency of the words that has been given as inputs to the system and the graph generated based on the inputs.

Table 1: Sample Inputs to the System

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Google</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>Yahoo</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>Gmail</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>News</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Video</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Weather</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>Movies</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>Messenger</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>Lifestyle</td>
<td>16</td>
</tr>
<tr>
<td>9</td>
<td>Cricket</td>
<td>20</td>
</tr>
<tr>
<td>10</td>
<td>Orkut</td>
<td>0</td>
</tr>
<tr>
<td>11</td>
<td>Facebook</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>Health</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td>Groups</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>Games</td>
<td>2</td>
</tr>
</tbody>
</table>

Fig. 2: Proposed System View of Tag Clouds

Fig. 3: Comparison Graph for the Inputs
VI. CONCLUSION & FUTURE WORK

It is experienced that the importance of tag clouds in the emerging computer technology. The trends in tag clouds using grid view and spark lines are implemented which gives visibility in tag clouds. In future work, the grid view of 2-D mechanism can be transformed to 3-D grid view where visibility of tag cloud might be better than this visibility.

REFERENCES


AUTHOR BIOGRAPHY

Mrs K. Sujatha received the BTech degree in Computer Science from JNTU Hyderabad. She is pursuing her MTech (CSE) from JNTUA College of Engineering, Anantapur. Currently working as Asst. Professor in CSE Department at BIT INSTITUTE OF TECHNOLOGY, HINDUPUR, and ANDHRA PRADESH. Her interested areas are Visualization, Image Processing, Cloud Computing and Data Mining.