Indonesian Journal of Education & Mathematical Science
Vol. 5, No. 1, Januari 2024, pp. 33~39
ISSN: 2715-985X, DOI: 10.30596/ijems.v5i1.16768

Online Frequency Distribution Application Using a Javascript-Based Blogger Platform

Rohmad Wahid Rhomdani[1], Chusnul Khotimah Galatea[2]
[1,2]Universitas Muhammadiyah Jember, Jember, Indonesia
[1]wahidgrup@gmail.com

ABSTRACT

This research develops an online frequency distribution application using the Javascript-based Blogger platform. The method used is a literature study, namely examining the frequency distribution of both the formulas used and descriptions in the Javascript programming language using mathematical logic. Online frequency distributions are essential for analyzing data, and by utilizing Javascript capabilities, this application allows users to easily input data and automatically generate informative frequency distributions. This article discussed the technical implementation, including the use of the Javascript programming language and its integration with the Blogger platform for online content creation. The results of this research contribute to the development of statistical applications that are easy to use and access online, thereby helping users understand and analyze their data more effectively.

Keywords: Frequency Distribution, Blogger, Javascript

This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Corresponding Author:
Rohmad Wahid Rhomdani,
Pendidikan Matematika, FKIP,
Universitas Muhammadiyah Jember,
Jl. Karimata No 49, Jember , Jawa Timur, Indonesia,
wahidgrup@gmail.com

1. INTRODUCTION

Frequency distribution is a daily requirement in data processing, according to Andjarwati et al. (2021). This is considered important because it can provide a clear picture of how the data is distributed or dispersed in a sample. To provide information about data patterns and assist in decision-making, it is necessary to understand frequency distributions so that people can make better decisions in situations where data currently plays an important role. (Arham & Nasir, 2020)

There are many statistical applications that are often used to calculate frequency distributions, such as the Statistical Package for the Social Sciences (SPSS) application, which is an application program that has the ability to analyze data statistically. SPSS applications are often used in various fields such as mathematics, business, health, research, and others. This application can organize data, perform statistical analysis, and visualize the results in the form of graphs or tables. (Santoso, S., 2020:09)

According to Priyastama (2020:10), SPSS is a very popular statistical application for calculating frequency distributions. This application was developed by a large company, namely IBM. However, this application has a license and must be installed on Windows. Gio and Rosmaini (2016) Almost the same as SPSS, there are several statistical applications that have licenses, such as Minitab, Microsoft Excel, Eviews, Lisrel, Amos, and Smartpls, but all of the applications above are data visualization and analysis to help users improve decision-making and provide outlook. All statistical applications have quite expensive licenses, especially for individual users or students who may have a limited budget. SPSS license prices can vary depending on the type of license required. (Huda, 2016)

Ramachandran and Tsokos (2020:39) said that there are several statistical applications that are complete and have free licenses for calculating frequency distributions, namely R software, but these applications use a programming language so that it is sometimes difficult for new users to learn. According to Bunn (2008), every time you run an R command, you have to use scripts and too many commands. Data storage in R is stored in physical memory, and executing coding in R takes quite a long time, especially

Vol. 5, No. 1, Januari 2024, pp. 33~39
ISSN: 2715-985X, DOI: 10.30596/ijems.v5i1.16768
since the R installation data is large. This is a weakness of the R program, which is a statistical application. To be able to operate R software effectively, users need to learn the R programming language. This may require a longer learning time and requires programming skills.

In using statistical applications, there are several obstacles, one of which is the large amount of data and the complexity of data modeling, making it difficult to manage existing data. The more complex the data, the more complex the completion process, and almost all statistical data can be resolved. just like using the latest and most paid online statistics applications. (Niani CR & Lewaherilla N, 2021)

All of these statistical applications have the disadvantage that they require installation on Windows and cannot be run on Android. Therefore, it is necessary to have statistical media that can be accessed easily online, is free and responsive, and can be accessed via mobile and desktop, especially frequency distribution material using JavaScript. In particular, the JavaScript programming language for online frequency distribution development is very light, easy to use, and does not require a license to use it. The JavaScript language is very popular for use in mathematical logic, and there are few online frequency distribution applications that are easier to run in a browser. (Rhomdani, 2022)

From all the explanations above, the solution for calculating and determining frequency distribution is online and free of charge using JavaScript. JavaScript development for frequency distributions is little studied in educational institutions. Therefore, researchers are interested in developing online frequency distribution applications using JavaScript. This online frequency distribution application will be given free access and can be accessed anywhere and at any time using a responsive blogger, which can be accessed via Android, a cellphone, or a laptop for the world of education.

2. RESEARCH METHOD

This research develops online frequency distribution using JavaScript for bloggers. The method used in this research was a literature study by reviewing the frequency distribution formula and then describing it in the JavaScript programming language using mathematical logic by utilizing JavaScript's capabilities as a powerful programming language in web development so that users can access this application via their web browser without needing to install addition software. (Moreira et al., 2022)

A looping algorithm, or for loop, is a control structure in programming that is used to repeat a series of instructions repeatedly as long as certain conditions are met. In the context of algorithms, for loops are often used to automate and execute a series of instructions with variations in certain values. (Mathulhusna, Efriyanti, & Okra, 2022).

3. RESULTS AND DISCUSSION

In statistics, frequency distribution is one of the fundamental concepts used to organize and describe numerical data. This concept helps us understand how data is spread across sets of different values. The results are presented in the form of tables or graphs that provide a visual depiction of the patterns and characteristics of the data. Frequency distributions allow us to identify the most common values and specific ranges of values in the data. With a better understanding of frequency distributions, we can draw more accurate conclusions about our data and make more informed decisions in a variety of contexts, from scientific research to business analysis. (Wahyuningrum, 2020)

The selection of Blogger as a platform for developing online frequency distribution applications is based on several important considerations. Blogger is a platform that is very popular, easy to use, and has a high level of openness. This allows developers to quickly build and integrate statistical applications without requiring very advanced programming skills, so that the applications developed can be easily accessed by users from various backgrounds. The advantages of Blogger as an online publication platform include the ease of managing content. Apart from that, Blogger also provides free hosting, which allows this application to be accessed online without additional costs. Blogger also supports responsiveness, so that applications can be accessed well on devices of various screen sizes, including cellphones and tablets. (Rhomdani RW & Rahayu, L.D., 2022)

Indonesian Journal of Education & Mathematical Science
Vol. 5, No. 1, Januari 2024, pp. 33~39
ISSN: 2715-985X, DOI: 10.30596/ijems.v5i1.16768

The main benefit of using Blogger in the context of statistical applications is the ability to easily disseminate data analysis results. Users can quickly publish frequency distributions generated by the application, making them available to others in an easy-to-understand form. Thus, Blogger provides an effective tool for sharing statistical information with relevant stakeholders, both in academic, business, and social contexts. (Hasan, S. et al., 2023)

One of the main roles of Javascript is to take input data from users in an interactive and responsive manner. With the help of Javascript, users can easily enter numerical data into the application, both in the form of single numbers and data sets. After receiving input data from the user, Javascript then plays a role in processing the data. This process involves counting the number of times each value appears in the dataset and then forming a frequency distribution. Javascript is also responsible for building informative displays, such as tables or graphs, to clearly depict frequency distributions to users. (Kurniawan, H. et al., 2023) Additionally, Javascript enables interactivity in applications. This means users can interact with the resulting frequency distribution, such as zooming or filtering the data, easily. According to Maulana, A (2023), in this way, the role of Javascript is not only limited to calculations but also to enriching the user's experience in exploring and understanding their own data. Thus, Javascript is a key component in this application, allowing the application to be more interactive, responsive, and useful in taking data input from the user and generating informative frequency distributions.

Previous Section Before this research is carried out, it is necessary to prepare study materials for the frequency distribution formula, starting from the formula for the amount of data, average, minimum and maximum value, range, number of classes, and length of class, and several supporting devices such as computers and browsers that meet the specifications for research trials. Each formula is studied to calculate the amount of data, average, minimum, and maximum value, and then described in the JavaScript programming language. From this formula, create an input box with a comma (,) separating format. like the following example:

```
input = 12,3,4,5,6,3,2,4,5,3;
var x = input.length;
var n = 0;
for(var i = 0; i<x; i++){n +=parseInt(input[i]);}
var mean=(n/x).toFixed(2);
var max = Math.max.apply(null, input);
var min = Math.min.apply(null, input);
```

The x value is the length of the input data array of n groups, which is then calculated to be the number of numbers in the input box. Next, we will recalculate the number of group data points and then determine the mean value, minimum value, and maximum value for the group data.

From the results of research trials in the computer laboratory at Muhammadiyah University of Jember, researchers were able to develop online frequency distribution using JavaScript on Blogger, starting with preparing and conceptualizing the frequency distribution formula, then creating a JavaScript application that was prepared, one of which was designing the frequency distribution concept manually, and then the researcher described it using mathematical logic. using JavaScript.

Researchers create or provide input boxes to be used as input for group data, and then with one calculation execution button, this application can calculate all solutions, namely, the maximum and minimum values, average, range, class length, number of classes, varieties or variants, standard deviation, and quartile values, including Q1, Q2, and Q3. After being able to map class length and number of classes data to group data, this application will be able to display a frequency distribution table starting from the upper and lower limits, display frequency values, and also display bar graphs, lines, and circle graphs on the results of group data analysis.

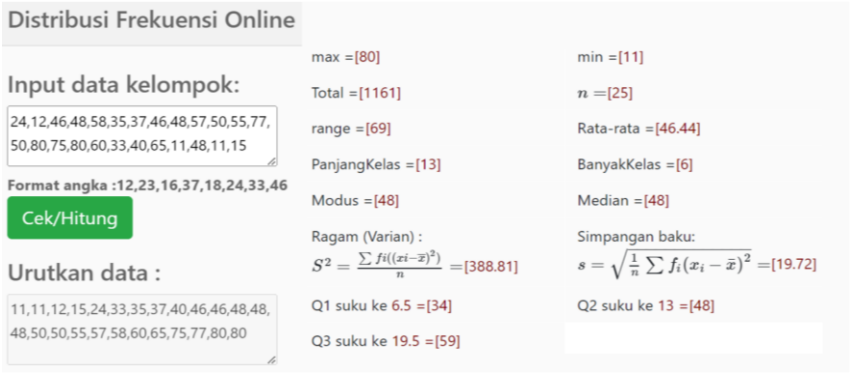
The following is the logic for calculating the amount of data, average, minimum and maximum value, range, number of classes, and class length on group data built using JavaScript as follows:

```
<textarea id="input" rows="3" cols="30">12,3,4,5,6,3,2,4,5,3</textarea>
```

Indonesian Journal of Education & Mathematical Science
Vol. 5, No. 1, Januari 2024, pp. 33~39
ISSN: 2715-985X, DOI: 10.30596/ijems.v5i1.16768

```
<p><button id="button" onClick="Hitung()">Hitung</button>
<p id="Tampil"/>
<script>
function Hitung(){
var input = ((document.getElementById('input')).value.split(',')).sort((a, b) =>
a - b);
 var x = input.length;
 var n = 0;
 for(var i = 0; i<x; i++){n +=parseInt(input[i]);}
 var mean=(n/x).toFixed(2);
 var max = Math.max.apply(null, input);
 var min = Math.min.apply(null, input);
 var range = max-min;
 var K = Math.ceil(1 +(3.3* (Math.log10(x))));
 var P = Math.round(range/K);
document.getElementById('Tampil').innerHTML = 'Banyaknya data = ' + x +
'<br>Jumlah data = ' + n + '<br>Rata-rata = ' + mean + '<br>Nilai max = ' + max
+ '<br>Nilai min = ' + min + '<br>Jangkauan = ' + range + '<br>Banyak kelas = '
+ K + '<br>Panjang kelas = ' + P;
}</script>
```

Fig 1. Online frequency distribution application



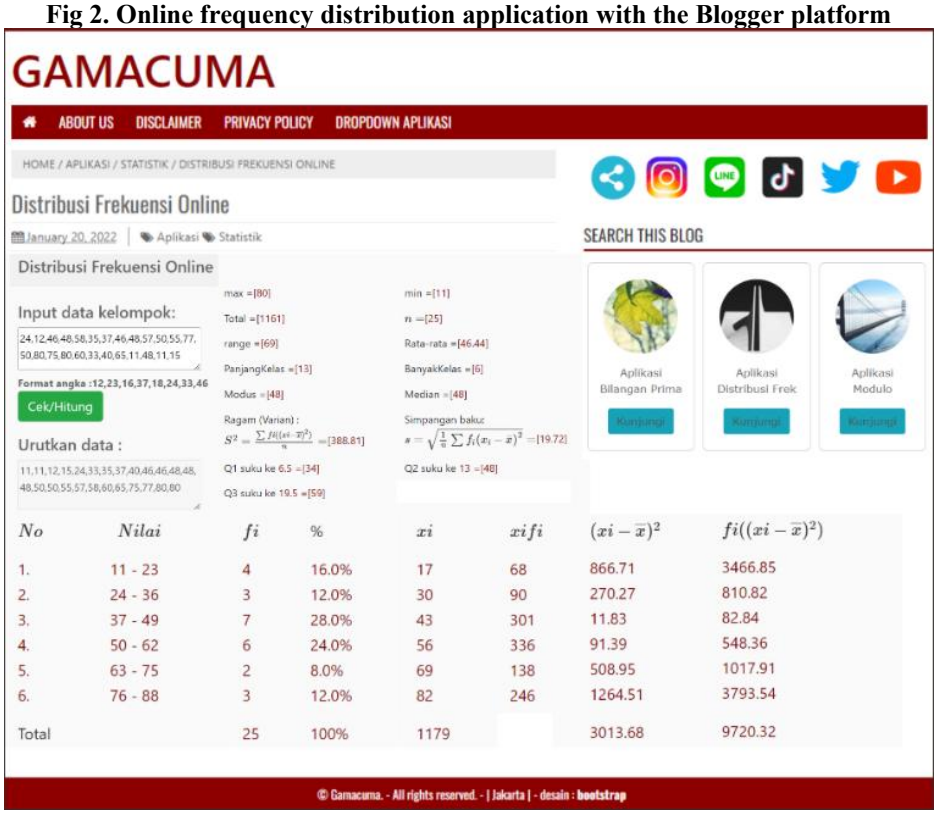
The algorithm above is used to calculate group data and successfully displays the amount of data, average, minimum and maximum value, range, number of classes, and class length using JavaScript. Furthermore, in the next script, the researcher will calculate the quartile values with the formula Q1 = (x(n+1))/4, Q2 = (x(2n+1))/4, and Q3 = (x(3n+1))/4 using JavaScript as follows:

```
var x = input.length;
if (x%2==1){
 var s1=(x-(-1))/4;var s2=2*(x-(-1))/4;var s3=3*(x-(-1))/4;
 }else{
      var s1=(x+2)/4;var s2=(2*x+2)/4;var s3=(3*x+2)/4;}
      var v = input.sort((a, b) => a - b);
 for(var i = 0; i<x; i++){
 if(s1%2==1 || s1%2==0){ if(i<s1){q1 =(v[i]);}
   }else{var t1=s1-1.5; var u1=s1-0.5;
    if(i==t1){var t11 =(v[i]);}
    if(i==u1){var u11 =(v[i]);}
    q1=(t11-(-u11))/2;}
 if(s3%2==1 || s3%2==0){ if(i<s3){q3 =(v[i]);}
  }else{var t3=s3-1.5; var u3=s3-0.5;
   if(i==t3){var t33 =(v[i]);}
   if(i==u3){var u33 =(v[i]);}
     q3=(t33-(-u33))/2;}}
document.getElementById("kuartil").innerHTML =
  'The 1st quartile value in the th term '+s1+' = '+q1+'<br>'+
  '2nd quartile value in the 2nd term '+s2+' = '+q2+'<br>'+
  'Quartile value 3 in term '+s3+' = '+q3+'<br>';
```

Indonesian Journal of Education & Mathematical Science
Vol. 5, No. 1, Januari 2024, pp. 33~39
ISSN: 2715-985X, DOI: 10.30596/ijems.v5i1.16768

Next, the researcher displays several distribution table calculations using JavaScript; the rest of the advanced algorithm is on the gamacuma.blogspot.com page, as follows: The algorithm used is a loop, or for loop, which is a control structure in programming that is used to repeat a series of instructions or blocks of code repeatedly as long as certain conditions are met. Next, to display distribution data, researchers use the 'for' loop algorithm. In JavaScript programming, looping algorithms using 'for' loops are one effective way to repeat a certain task a certain number of times.

Fig 2. Online frequency distribution application with the Blogger platform



No	Nilai	fi	%	xi	xifi	$(xi-\bar{x})^2$	$fi((xi-\bar{x})^2)$
1.	11 - 23	4	16.0%	17	68	866.71	3466.85
2.	24 - 36	3	12.0%	30	90	270.27	810.82
3.	37 - 49	7	28.0%	43	301	11.83	82.84
4.	50 - 62	6	24.0%	56	336	91.39	548.36
5.	63 - 75	2	8.0%	69	138	508.95	1017.91
6.	76 - 88	3	12.0%	82	246	1264.51	3793.54
Total		25	100%	1179		3013.68	9720.32

The for loop is a very useful tool for automating tasks that require repetition, such as processing arrays, examining data, or performing repetitive operations that allows developers to run code efficiently without needing to rewrite the same task repeatedly to automate repetitive tasks or execute a set of instructions with variations in certain values. The researchers then worked out the following formula:

Fig 3. Code formula Loop

```
<script>
function tabel(){
 var input = document.getElementById('input');
 var maka = input.value.split(',');
 var n = maka.sort((a, b) => a - b);
 var total = 0;
 var banyak = n.length;
 for(var i = 0; i<banyak; i++){total +=parseInt(n[i]);}
 var max = Math.max.apply(null, n);
 var min = Math.min.apply(null, n);
 var range = max-min;
 var bkelas=1 +(3.3* (Math.log10(banyak)));
 var Bkelas=Math.ceil(bkelas);
 var Pkelas=Math.ceil((range)/bkelas);
 var arr = n;
```

Vol. 5, No. 1, Januari 2024, pp. 33~39
ISSN: 2715-985X, DOI: 10.30596/ijems.v5i1.16768

```
function inRange (x) {return this[0] <= x && x <= this[1]}
 let no='';
 for(i=1;i<=Bkelas;i++){no+=i+'.<br>';}
 var a=min;n=a+Bkelas;b=Pkelas;b1=Pkelas-1;let dkelas='';let frekx='';
 for(i=a;i<n;i++){
       kiri=i*b-a*b+a;kanan=i*b-a*b+a+b1;
       dkelas+=kiri+' - '+kanan+'<br>';
 frekx += arr.filter(inRange, [kiri,kanan]).length+"<br>";}
 document.getElementById("no").innerHTML = no;
 document.getElementById("dkelas").innerHTML = dkelas;
 document.getElementById("frek").innerHTML = frekx;
 }
</script>
<textarea id="input" rows="3"
cols="30">55,65,76,78,55,47,89,89,89,70,77</textarea><br>
format N = 55,65,76,78,55,47,89,89,89,70,77
<p><button id="button" onClick="tabel()">Click</button>
<br>
<table border="1">
  <tr>
   <td>No</td><td align ="center">Nilai</td>
   <td><center>Frekuensi</td>
  </tr>
  <tr>
   <td><p><p id="no"></p></td>
   <td align ="center"><p id="dkelas"></td>
   <td align ="center"><p id="frek"></p></td>
  </tr>
</table>
```

This online frequency distribution no longer uses the straight or tally method; everything is run by a mathematical logic programming language using JavaScript. More details about the continuation of the JavaScript algorithm are on the gamacuma.blogspot.com page. Researchers have made innovations as well as additions and modifications for the next article. Then the researchers used bar graphs with Chart.js, which is a JavaScript programming language for visualization of statistical data that supports chart types, namely bar charts for displaying frequency data. Chart.js was created by Nick Downie in 2013, a London-based web developer, but now Chart.js is maintained by the GitHub community and is the second most popular JavaScript charting library on GitHub based on the number of stars after D3.js. then Chart.js is much easier to use and very responsive and customizable. Chart.js is rendered in HTML5 canvas, supports all browsers, and is widely sought after as one of the best data visualization libraries. (Downie, 2013)

4. CONCLUSION

In this research, an online frequency distribution application has been successfully developed using the Blogger platform and based on the Javascript programming language. This application makes it easy for users to analyze data by automatically generating frequency distributions. Integration with the Blogger platform allows users to publish analysis results online, making them easier to access and use by others.

Thus, this application is a useful solution for supporting statistical data analysis, especially for those who do not have a strong technical background. Users can quickly understand patterns in their data and share them with others via the Blogger platform. This application creates new opportunities to spread statistical understanding and increase engagement in data analysis online. More details about the continuation of the JavaScript algorithm are on the gamacuma.blogspot.com page. Researchers have made innovations as well as additions and modifications for the next article. Especially in this digital era, developing this kind of application has the potential to provide great benefits for various fields, from education to business.

ACKNOWLEDGEMENTS

I need to say to the author, thank you for correcting the programming logic to my friends Chusnul Khotimah Galatea and to the Jember Muhammadiyah University Laboratory Team, of which I am proud.

REFERENCES

[1] Andjarwati, T., Budiarti, E., Susilo, K.E., Yasin, M. and Soemadijo, P.S., (2021). Statistik Deskriptif. Zifatama Jawara.
[2] Arhami M dan Nasir M. (2020). Data Mining-Algoritma dan Implementasi. Penerbit Andi.
[3] Downie, N., (2013). Chart. js.
[4] Bunn, AG, (2008). Pustaka program dendrokronologi dalam R (DPLR). Dendrocronologia , 26 (2), hlm.115-124.
[5] Gio, P.U. and Rosmaini, E., (2016). Belajar Olah Data dengan SPSS, Minitab, R, Microsoft Excel, EViews, LISREL, AMOS, dan SmartPLS. Universitas Sumatera Utara, Medan, Indonesia.
[6] Huda, D.N., (2016). Perbandingan Software Data Mining Berbayar dan Open Source. Jurnal Bangkit Indonesia, 5(1).
[7] Hasan, S., Jauhar, N., Hirto, V. A., Suryantari, Y., Rukmana, A. Y., Supriyanto, B. F., ... & Sudirjo, F. (2023). Pemasaran Produk Pariwisata: Melalui Konten Visual. Get Press Indonesia.
[8] Kurniawan, H., Syafa'at, F., Budihartono, E., Lorosae, T. A., Apriana, D., Marisa, M., ... & Rahman, E. (2023). Belajar Web Programming: Referensi Pengenalan Dasar Tahapan Belajar Pemrograman Web Untuk Pemula. PT. Sonpedia Publishing Indonesia.
[9] Moreira, R., Fialho, R., Teles, A.S., Bordalo, V., Vasconcelos, S.S., de Morais Gouveia, G.P., Bastos, V.H. and Teixeira, S., (2022). A computer vision-based mobile tool for assessing human posture: A validation study. Computer Methods and Programs in Biomedicine, 214, p.106565.
[10] Mathulhusna, L., Efriyanti, L., Supriadi, S. and Okra, R., (2022). Pengaruh Pembelajaran Berbasis Proyek Terhadap Hasil Belajar Logika Algoritma di IAIN Bukittinggi. Indonesian Research Journal on Education, 2(3), pp.1173-1179.
[11] Maulana, A., Bau, R. T. R., Hermila, A., Munawar, Z., Setiawan, R., Aisa, S., ... & Permana, A. A. (2023). Pemrograman Web 101: Memahami Dasar-Dasar Untuk Mengembangkan Situs Web. Get Press Indonesia.
[12] Priyastama, R., (2020). The Book of SPSS: Pengolahan & Analisis Data. Anak Hebat Indonesia.
[13] Ramachandran, KM dan Tsokos, CP, (2020. Statistik matematika dengan aplikasi di R. Pers Akademik.
[14] Rhomdani, R.W., (2022). Algoritma Modulo Berpangkat Menggunakan Teorema Binomial Newton dan Phi Euler Dengan JavaScript. Teorema: Teori dan Riset Matematika, 7(2), pp.403-410.
[15] Rhomdani, R.W. and Ningtyas, Y.D.W.K., (2021). Aplikasi modulo berpangkat ab mod n menggunakan pola barisan dan teorema Euler berbasis web. JEMS: Jurnal Edukasi Matematika dan Sains, 9(2), pp.499-506.
[16] Rhomdani, R. W., & Rahayu, L. D. (2022). Pengembangan Website Paud Terpadu Aisyiyah Kaliwates Jember Menggunakan Blogger dan Bootstrap. Jurnal Teknologi Informasi, 8(1), 12-19.
[17] Santoso, S., (2020). Panduan Lengkap SPSS 26. Elex Media Komputindo.
[18] Wahyuningrum, S. R. (2020). Statistika pendidikan (konsep data dan peluang). Jakad Media Publishing.