

ANALYSIS OF RAW DATA RETURNED BY MOST USED ONLINE PUBLIC OPINION POLLS TOOLS

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Abstract

The appearance and evolution of the questionnaire are strictly linked to the history of statistics as a science. Why is the questionnaire related to the history of statistics? As the questionnaire is not a simple list of questions, the important part behind the questions is the statistical interpretation of the answers received from respondents. We have entered several platforms of public opinion polling, with the idea of seeking maximum effect with minimum effort, from a beginner's position – how can an entrepreneur be at the beginning of the road. It was conducted research on how works and what deliverables give several platforms of public opinion polling. Each tool that loaded and launched the opinion poll on the consumption of craft beer gave answers with different characteristics, the only common basis being the choice of the free package. Results from Google Forms, ZoHo Survey, and Survey Monkey were analyzed and compared. Of all these, the easiest to work with and most complete is ZoHo Survey for those who don't want to use subscription services, and with some financial effort for a Survey Monkey subscription.

Key words: market research, survey, entrepreneur

INTRODUCTION

The history of statistics as a science is directly related to the appearance and development of the questionnaire. Why is the history of statistics relevant to the questionnaire? The statistical interpretation of the responses provided by respondents is crucial because the questionnaire is not just a list of questions. The first written questionnaire was used in 1838 to obtain complete information about the impartial history of strikes (Gault, R., 1907) [5].

One of the most important topics to be solved by statistics in the UK was related to the educational attainment of children from different backgrounds, especially the poor. All sorts of questionnaires have been dealt with on the issue of children's education for many decades. Concerns about statistical studies are also mentioned in other countries, among which it is well known that a statistical office founded in 1862 is taking place in Germany and then publishes a statistical yearbook (Statistical Bureau of Berlin, 1900-1902) [12].

If are maintain the questionnaire's objectives in mind from the first draft through the revisions made after pretesting, the processes of organizing and creating the questionnaire are much simpler [4], [8], [9]. When designing a questionnaire, it is common, to begin with a hypothesis or hypothesis of the study (Groves, R., Fawlers, F., Couper, M., Lepkovski, J., Singer, E., Tourangeau, R., 2009) [6]. If a literature review makes this suggestion, you may already have a framework that will guide the questions you should ask and the order in which they should be asked, or you may be using an already-existing tool, like a client satisfaction survey. Combining a completely structured questionnaire technique with an exploratory investigation in which interview subjects (perhaps key informants) are questioned in detail is also not uncommon (Boynton PM, Greenhalgh T., 2004) [1].

In an effort to have the greatest impact with the least amount of effort, we have entered many public opinion polling sites, in other words, to find through our own experience

which platform/instrument dedicated to our purpose is easier to approach, closer to general search results, and more advisable, from a not expert position.

Thus, research was conducted on the operations and outputs of various public opinion polling platforms with the goal of achieving maximum impact with the least amount of effort, or, in other words, to determine which platform/instrument dedicated to any entrepreneurship is simpler to approach, closer to general search results, and free of financial support.

The only factor that all of the tools that loaded and launched the opinion survey on craft beer consumption had in common was the selection of the free package. We studied and contrasted the responses from Google Forms, ZoHo Survey, and Survey Monkey.

The purpose of this paper is to make a comparative analysis of raw data returned by the most used online public opinion polls tools.

MATERIALS AND METHODS

For the construction of the opinion poll on the consumption of craft beer we choose to conduct a quantitative analysis, because the primary focus of quantitative research is on numerical data and measurable, and at the end we done an analyze of the responses using statistical methods. The research question was defined before conducting the survey.

We use several types of questions such: question filter, factual questions, question control, question inquiries, scoring question (leader board or constant amount), etc.

The construction of an online survey tool is quite complicated, use deductive and inductive logic, and provides both basic functions granted in many cases free of charge to users and advanced functions of the market questionnaire offered for a fee (Duşa, A., 2014) [2], Efferit [3].

The chosen topic for which we have built and launched the opinion poll, is related to the functional craft beer product.

This paper does not aim to analyze the results of the online questionnaire by interpreting the

answers received from the respondents to each question, so we will not use the formula:

$$\frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)} \dots \dots \dots (1)$$

Source: [7].

where:

- N – population size
- e – margin of Error (as a decimal)
- z – Confidence level (as a z-score)
- p – percentage value (as a decimal)

The number of responses required for a representative sample is calculated by reference to the margin of error.

For example, for a population size of more than 100,000 people, 1,100 responses are required for the margin of error of ±3%, for the margin of error of ±5% 400 responses are required, and for the margin of error of ±10% 100 responses are required.

The material used is provided by the internet network and consists of the different types of tools made available to users, both free of charge, with basic and surcharge facilities, in versions that can diversify the ways of interpreting the results and/or help collect responses from account users who are paid to periodically complete, according to their options, all sorts of market surveys.

To carry out the comparative analysis that we proposed, we used the method of analysis through information and data collection and the method of comparison. A special contribution was also made by the free discussions held over time with different people regarding the choice of the type of instrument to use to build and launch an opinion poll.

To run a logical route in the way of organizing the questions, we first introduced the social questions, after which we entered the topic itself, seeking to filter the responses received taking into account a certain percentage applied to the age area, home area, educational training area, etc. where appropriate to ensure a proportionate balance of responses and diversity of situations, which often results in the representativeness of the

statistical sample [10], [11]. The questionnaire included a total of 20 questions and is posted bellow.

This survey is aimed at all people over the age of 18 on all social networks.

The theme of the survey is craft beer, which is known to have influence in the United States.

The objective of the questionnaire is to analyze the responses received from the various opinion polling platforms.

1. What age group do you belong to

- Between 18-25 years' old
- Between 26-35 years' old
- Between 36-45 years' old
- Between 46-55 years' old
- Over 55 years' old

2. Your genre is

- Male
- Female

3. You live in the

- Urban environment
- Countryside

4. What is the last degree achieved

- Baccalaureate
- Bachelor
- Master
- PhD

5. Study or perform core tasks in

- Public environment
- Private sector

6. The income level of the household per person belongs to this category

- Below 2,000 lei
- Between 2,001 – 3, 000 lei
- Between 3,001 – 4,500 lei
- Between 4,500 – 6,000 lei
- Over 6,001 lei

7. How many people do you have in your family?

- 1
- 2
- 3
- More than 3

8. You're single or have a relationship

- Single
- Having a relationship

9. As you appreciate, the transition through the COVID-19 pandemic influenced your eating or drinking habits

Yes

No

I don't have any opinion about that

10. Are you drinking beer

Yes

No

11. Do you like beer?

Yes

No

12. Do you drink craft beer

Yes

No

13. If the answer to the previous question is No, what is the reason why you are not drinking craft beer?

Smell

Taste

Strongness

Price

Other

14. Sometime, in the future, would you be willing to drink craft beer?)

Yes

No

Maybe

15. If yes, usually, when you drink craft beer, you are

Alone

Together with friends or family

16. To order craft beer, often

I go to the brewery, shop etc

I order online

17. How many times do you drink craft beer monthly

Once

Twice

Between 2-5 times

Over 5 times

18. How much do you spend monthly to consume the craft beer?

Between 10-50 lei

Over 50 lei

19. What is the main reason why you appreciate/prefer craft beer?

Taste

Smell

Strongness

Other

20. How much are you willing to pay for 1 L of craft beer?

Under 20 lei

° Over 20 lei

Thank you very much for your answers

For our survey we used online methods, the questionnaire was handed in by email and Facebook social network.

RESULTS AND DISCUSSIONS

Results obtained after launching the questionnaire in Google Forms

In short time after launching the questionnaire in Google Forms, the results begin to show up.



Fig. 1.A. How to display responses in the form of graphs collected in Google Forms (A)
 Source: original data recorded from the research.

On Google Forms it was obtained some responses (34), with a wide range among respondents, the distribution of this survey was made through the social network Facebook. By default, Google forms open on the question area, but by switching to the next area – answers – it can be seen the options below (Figure 1).

What is visible on the surface is that each graph can be copied into a form that appears unique, i.e., pie chart. On the right, we find an elevator that certifies that the survey is still open and that further answers can be received

(A). When we think we have enough answers, we can easily switch to the closed position. The image below (B) highlights what appears by the action of the 3 points on the top right, where we are facilitated by several actions: We receive notifications for new answers, send answers by selecting the destination, and download the answers in .csv format, print all the answers or delete all the answers.

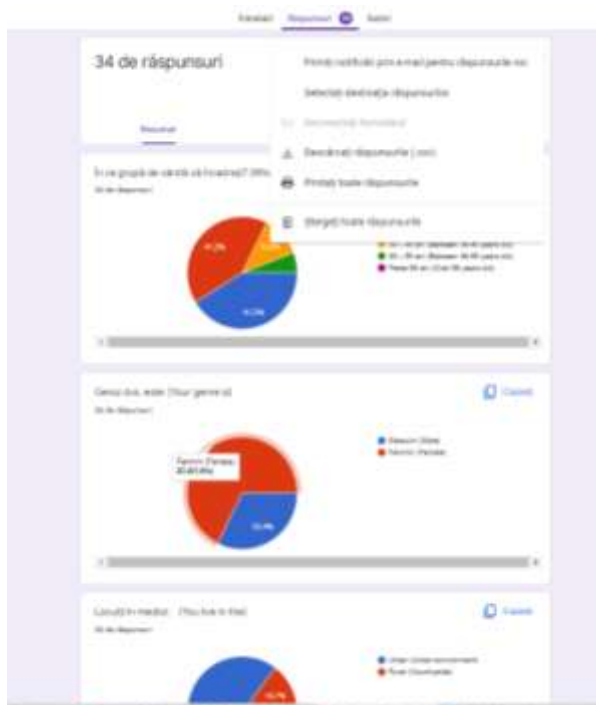


Fig. 1.B. How to display responses in the form of graphs collected in Google Forms (B)
 Source: original data recorded from the research.

The CSV extension means "comma-separated values", each line representing a data record, and each record contains a field or fields that are separated by commas.

Unfortunately, it is not given the number of answers for each variant of the question, but only the percentage of respondents for each variant of the question.

The .csv format is not very helpful; the data is difficult to follow as can be seen in Figure 2.



Fig. 2. Display in .csv format from Google Forms
 Source: original data recorded from the research.

The last area of the *Answers chapter*, the one of the Individual, presents for each respondent the answers given for each question (Figure 3).

Those who want to make all sorts of correlations between the answers to the questions can gather and interpret how thoroughly they need the data. The only condition is to have the time, power, and patience to manually pass the received answers on an Excel file and make additional statistical interpretations, possibly using pivot tables.

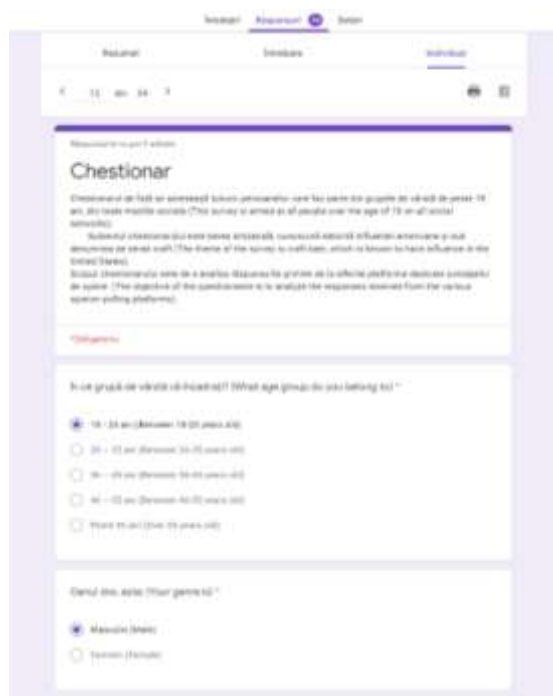


Fig. 3. Display questions one at a time in Google Forms
 Source: original data recorded from the research.

Results obtained after the launch of the questionnaire in ZoHo Survey

When opening the account in the ZoHo Survey, we choose which questionnaire we want, if we have multiple surveys or the only questionnaire hosted by this particularly useful tool (Figure 4).



Fig. 4. The overall report of the results obtained in ZoHo Survey
 Source: original data recorded from the research.

It can be seen that the number of responses is written large and central, and on the sides appears the survey publication date and the record date of the last response. On the left vertical black strip, it is distinguished by red that this information is part of the *Summary* area. We are more interested in what results from we find in *Reports*.

In *Reports*, we find THE SUMMARY OF RESPONSES and INDIVIDUAL RESPONSES. In the following, we will first present THE SUMMARY OF RESPONSES. In this subchapter, it can be observed the number of answers and the status of complete or not answers, as we find the number of visitors who saw the questionnaire. Our survey of craft beer with the ZoHo Survey showed 67 complete responses, 0 partial responses, and 138 visitors (Figure 5).

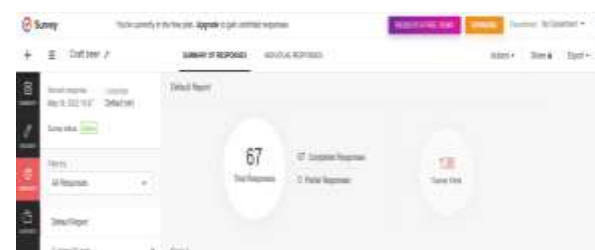


Fig. 5. Detailed report of the overall results obtained in the ZoHo Survey
 Source: original data recorded from the research.

Given that we chose the free version from the beginning and continue without upgrading to one of the proposed plans, we can only describe that what we can see, in the case of answers, is the *Default Report*. There are also Custom Report, Cross-Tab Report, and Trend Report variants, but these variants require upgrading. Each question presents both a pie

chart with the percentage responses of the respondents and a table below the graph where the answers for each variant are recorded, with number and percentage (Figure 6).



Fig. 6. Detail the answers to each question
 Source: original data recorded from the research.

The interesting part is that this tool even offers us a variety of forms in which to take the recorded data. In addition to the default pie chart shape, we can change the chart as a presentation into the following forms:

- Horizontal bar,
- Vertical bar,
- Line chart,
- Arc chart,
- Donut,
- Spider web,
- Area chart,
- Stacked horizontal bar
- Stacked vertical bar.

It is possible to:

- select or not to show the figures in the graph,
- make the label appear only in legend, or label in a chart, or no label, the legend can be positioned up, down, left or right,
- set the data recorded in the table to be visible or not,
- fix how many decimal places to be provided in the report – graph and data table,
- sort how to appear the order of answers represented in the graph: the order was given by us of answers or the original order, alphabetically ascending or descending, by the highest values or by the lowest values (Figure 7).



Fig. 7. Sort how responses appear on the chart at the ZoHo Survey
 Source: original data recorded from the research.

Finally, responses can be collected through export. In Figure 6 you can see the existence of an export button on the top right and there you can find two ways to export: As an image and as a pdf. From there it is possible to export all the graphs with related data tables with everything but taking each one and selecting how to export (image or pdf).

Speaking of export, we can't move on without showing that on the left vertical black tape there's an export button. When pressing it we find all the questions with the facility to select them all, in pdf format. However, the free version cannot download all the results by launching an order. It is needed to proceed to download all files manually, to be stored and used as it is needed. The answer to one of the questions received in both png and pdf format and then made the screen-cut to be attached inside the work is presented below (Figure 8).

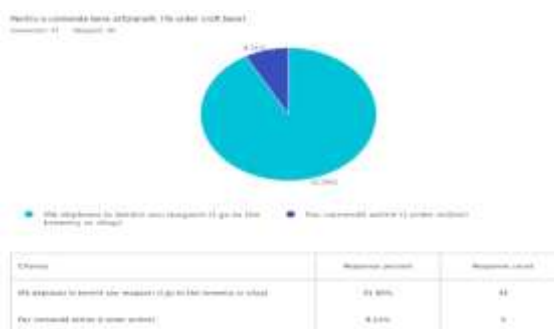


Fig. 8.A. Export responses as an image file with the extension .png
 Source: original data recorded from the research.

In the form of an image (Figure 8.A), the exported data appears to have a poorer visibility if we treat them compared to the processed image in the pdf file (Figure 8.B). Either way, the fact that we can process and download the graphs in what form we want is a plus brought by the ZoHo Survey.

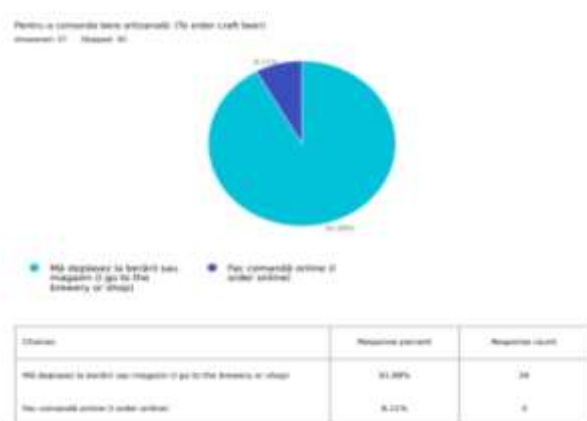


Fig. 8.B. Export replies as pdf file
 Source: original data recorded from the research.

At the end of the analysis of the responses received from ZoHo Survey in Figure 9 is shown that in THE INDIVIDUAL RESPONSES window get all the answers given by each respondent.



Fig. 9. Individual responses in the ZoHo Survey
 Source: original data recorded from the research.

Results obtained after the launch of the questionnaire in Survey Monkey

To gain the answers received in the account opened at Survey Monkey, the first image on the access page is the summary page of the survey results and it looks like in Figure 10. The following pieces of information are included:

- how many responses are collected,
- the fact that the survey is open, anyone can answer, and
- a global analysis of the survey.



Fig. 10. Number of responses and survey status in Survey Monkey
 Source: original data recorded from the research.

If the results are considered weak and it is needed a new targeting of the respondents, a new impetus for gathering a new wave of answers can be made through the collect answers window in Figure 11. At a certain time, if the number of responses does not change, notifications are sent to the mail that we can be helped against a fee to optimize the survey and even further, to increase the number of respondents.

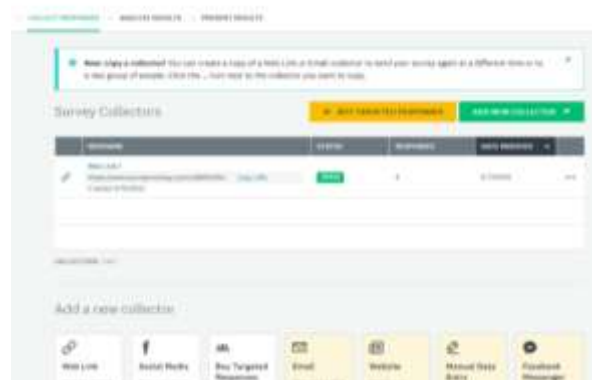


Fig. 11. Proposals from SurveyMonkey to increase the number of respondents
 Source: original data recorded from the research.

On the panel of ANALYZE RESULTS, 3 areas provide different information (Figure 12 A and B): *Questions Summarise*, *Insights and data trends*, and *Individual responses*.

It can be chosen:

- whether to display the received records graphically,
- the shape of the graph,
- colors in the chart,
- the figures on which the graph was built,
- number of the decimal places,
- if the display of the scale is in the form of absolute or relative (%),

- display of data in tabular form.

If the question and the answers given in both graphical and tabular form are observed in detail in the figure, the form of presentation of the graph may be chosen by the one who is collecting the answers, as shown in Figure 12 B. Presentation options of the graph are Horizontal bar, Vertical bar, Stacked Horizontal Bar, Stacked Vertical Bar, Pie Chart, Donut Chart, Line Graph, and Area Graph.

The option to decide whether each graph should be personalized or all graphics to look the same is made available and by pressing the Save button the instruction is given about the desired decision and it is visible into account.



Fig. 12.A. Question and Answer – Chart and Table in SurveyMonkey
 Source: original data recorded from the research.

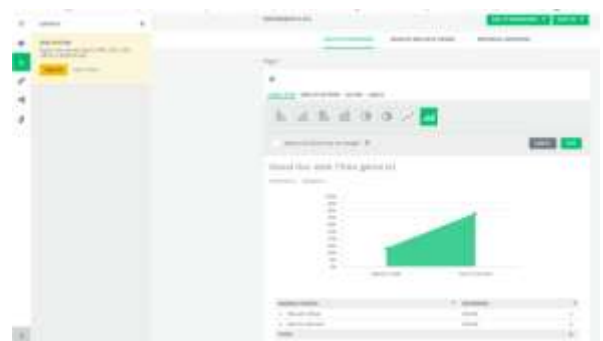


Fig. 12.B. Choosing the type of graph in SurveyMonkey
 Source: original data recorded from the research.

For the analysis of statistical significance, however, the free plan is not sufficient, the following financial plans are given as alternatives for these results (Figure 13).

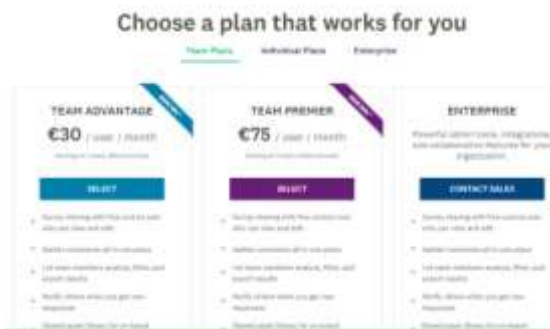


Fig. 13. Financial plans made available for results that include statistical significance in SurveyMonkey
 Source: original data recorded from the research.

In the *Insights and data trends* area (Figure 14) some data are made available from the less visible part, namely: survey completion rate, the average time spent by a subject to answer the questionnaire, and other information that can be chosen from the existing ones in the survey if someone is interested in the reactions of respondents to a particular question.



Fig. 14. Details about respondents in SurveyMonkey
 Source: original data recorded from the research.

It can be seen in the upper left corner of the previous image that only when upgrading the account, it is possible to benefit from exporting data in all kinds of PDF, XLS, PPTX, CSV documents, or even in SPSS format. For a more advanced EXCEL user, upgrading to SPSS format can be bypassed by copying responses and forming pivot tables using them.

The last visible area is *Individual responses*, which present some very detailed data about the person who completed the survey, time of completion, IP address, and the answer to every question for this person (Figure 15).

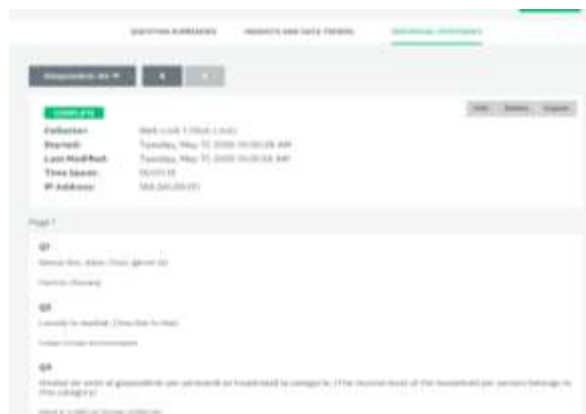


Fig. 15. Individual responses collected in SurveyMonkey

Source: original data recorded from the research.

Each tool that loaded and launched the opinion poll on the consumption of craft beer gave answers with different characteristics, the only common basis being the choice of the free package.

It would have been the questionnaire itself as a common basis if half of the questions had not been cut for the free package from SurveyMonkey, because here only 10 questions can enter the free package.

As a result of the results displaying differences, which were important in the analysis phase, each feature encountered in the results area was entered into a summary table to be analyzed by comparison and discussed (Table 1).

Comparative analysis of raw data received

Table 1. Comparative analysis of responses received using various online tools – free version

Characteristics	Google Forms	ZoHo Survey	SurveyMonkey
At the opening of the survey	There are 3 areas, the answers area is central and is bounded by the question area and the settings area.	There are 3 areas, the response area is central, it is limited by the date of publication of the survey and the date of the last recorded response.	There are 3 areas, the answer area is on the left side, the center is the status of the survey, and the right of the person to whom the completion notifications are sent.
	The number of responses is visible by marking it in a colored circle on the Answers button.	The number of responses is visible by marking it in a colored circle on the edge.	The number of responses is given in the following type: n total responses/ n visible responses
Graphical display	Pie chart	Pie chart – default	Horizontal bar - default
		Variations of shape change: Horizontal bar Vertical bar Line chart Arc chart Donut Spider web Arca chart Stacked horizontal bar Stacked vertical bar	Variations of shape change: Horizontal bar Vertical bar Pie Chart Donut chart Line graph Area graph Stacked horizontal bar Stacked vertical bar
Customize the shape of each graph	No	Yes (Each chart separately)	Yes (Each chart separately or all graphs the same)
Set graphic colors	No	No	Yes
Change the order of answers in the chart	No	Of choice: -the original order (according to the survey responses) -alphabetically ascending or descending -by the highest or lowest values	Of choice: -the original order -alphabetically ascending or descending
Show the number of	Percentage	Percentage	Optional

responses in the graph	Cannot disable, must appear	It is possible to disable the display	It is possible to disable the display
Decimal number setting	No	Yes	Yes
Display label	Only in legend	It is possible to appear: -in legend -in chart	It is possible to appear: -in legend -in chart
Show legend	Yes	Yes	No
Position of legend	Cannot be set	At choose: -up -down -left -right	No legend to comment
Display the scale	Cannot be set	It can be set in absolute or relative form (%)	It can be set in absolute or relative form (%)
Show the number of answers in the table	No	Yes	Yes
Show individual responses	Yes	Yes	Yes
Download results variants (export)	-Each question -Type .csv	-Each question -Format image (.png) and/or .pdf	No

Source: original data recorded from the research.

CONCLUSIONS

Over time, opinion polls have become increasingly important due to the diversification of consumer needs and changing consumer preferences.

In the present scientific paper, it is presented a research on how works and what deliverables give several platforms of public opinion polling, with the idea of seeking maximum effect with minimum effort, in other words, to find which platform/instrument dedicated to any entrepreneurship is easier to approach, closer to general search results, and more advisable for those who are at a beginning of carrier, without experience and financial resources.

Each tool that loaded and launched the opinion poll on the consumption of craft beer gave answers with different characteristics, the only common basis being the choice of the free package. Results from Google Forms, ZoHo Survey, and SurveyMonkey were analyzed and compared. The conclusions are presented below:

-comparing these 3 platforms, Google Forms presents results as a pie chart, ZoHo Survey presents results default as a pie chart, but has more types of chart available for chance and MonkeySurvey presents results default as a horizontal bar chart, but also has more types of chart available for chance,

-Google Forms do not allow to customize the shape of each graph, instead, ZoHo Survey and Survey Monkey allow this – even Survey Monkey allows each chart separately or all graphs the same,

-only SurveyMonkey allows setting graphic colors,

-Google Forms is the only one that does not give the possibility to change the order of answers in the chart. On this aspect, ZoHo Survey gives more possibilities even than SurveyMonkey,

-the number of responses is shown in the graph as % and it is not possible to be disabled at Google Forms, instead of at ZoHo Survey and SurveyMonkey can be not displayed,

-the legend is shown only in Google Forms and ZoHo Survey,

-results can be exported question by a question at Google Forms and ZoHo Survey, but cannot be exported at SurveyMonkey. At Google Forms the only way to export is .csv, ZoHo Survey allows a choice of image format as .png and/or .pdf

-only SurveyMonkey limited the survey to 10 questions for the free package.

We have two recommendations for those who want to do market research:

(i)For designing a survey:

-be as brief and exact as you can and donot ask too many questions and keep your

inquiries brief. Long online surveys may turn away potential participants,

-questions from the same topic area that are similar should be grouped,

-avoid using the yes/no question type whenever you can (you are unable to compare different participant perspectives as a result),

-in quantitative surveys, you provide potential answers, such as on a scale from 1 to 10 or multiple-choice questions,

-in qualitative surveys, you ask open-ended questions.

(ii) For those who want to do market research without paying a fee to use the ZoHo Survey tool and for entrepreneurs who can afford to pay for one of the fee packages to use the SurveyMonkey tool.

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