# Appendices

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### 8.3 Tablet speaker collage

From the collage, it is concluded that the placement of the speakers varies for every brand and every model. There are some brands where there is a cut in the screen for the speaker outlet, but very few brands use this approach. The speakers are mostly placed on the sides or back of the tablet to keep the screen free from any cuts.

There is another difference in speaker design among price ranges. High-end tablets have four speakers placed in each corner where the mid and low-end have either two speakers or one speaker. The two speakers can be placed on either side, but for the iPad, the two speakers are placed on one side. These sides can also differ, sometimes the short side is used while in other cases the longer side is chosen. The different placements are likely caused by the various numbers of positions for a tablet and the fact that the speakers should fit in the intended design. With four speakers in each corner, the audio can be adjusted to the position of the tablet; this makes the design more versatile.

When focussing on the specific speaker drivers that are used in tablets, they all appear to be coil speaker drivers. This type of speaker has an outlet from where the airwaves are distributed; this means that the design of the tablet should have a hole in which this outlet can be placed. In the selection of speaker drivers, the price ranges influence the choice on which driver to select. More expensive tablets have custom speaker systems, while low-end tablets use off-the-shelf drivers. Looking at the price difference between these speakers, the speakers for the iPad Pro are 12.40 dollars for a set of four. A set of four standard off-the-shelf speaker drivers from Alibaba would cost around 1 dollar. However, these prices are based on resellers of these components. So the manufacturers of the tablet might get them for a lower price. Another effect of the price range is the allocated space for the speaker drivers. In both the iPad Pro and the Samsung Galaxy Tab S6, there is a lot of room for these speakers, and they also seem to be specially designed for these specific tablets. The breakdown by Ifixit shows foam insulated speaker chambers in the iPad Pro.

#### MAIN TAKEAWAYS:

- High-end tablets have up to four speakers, one in each corner. In comparison, low-end tablets have one or two speakers on only one side.
- A stereo audio output is less important in low-end tablets but is a standard in high-end tablets.
- The placement of speakers in tablets is often at the back or sides of the tablet, but companies are sometimes experimenting with other placements.
- A cut in the sides of the screen is not preferred by the industry, although some companies still chose this option.
- In low-end tablets, the speaker system is not designed for that specific tablet. For high-end tablets, more attention is given to design a custom speaker driver with a speaker chamber.
- The industry uses mainly coil speakers drivers in tablets which range from 0.25 dollars for low-end tablets up to 3.1 dollars for high-end tablets.



### Connectiviteit

iPad Pro is het ultieme mobiele werkstation. Je kunt draadloos bestanden afdrukken, projecteren en versturen. De USB-C-poort is geschikt voor allerlei accessoires, zoals een camera, externe schijf of display. Wifi en LTE zijn sneller dan ooit, dus je hebt overal verbinding. En het fantastische audiosysteem met vier speakers is ideaal als je zin hebt om tv te streamen of je favoriete muziek te luisteren.

Vanaf: € 239.00

BEKIJK MODELLEN

Huidige Modellen Bekijken

**Functies** 

Beoordelingen

**Technische Specificaties** 

### Krachtig geluid uit vier luidsprekers

Dompel jezelf onder in het diepe, bulderende geluid, dat films, series en video's laat klinken alsof je het op een thuisbioscoop afspeelt. De vier luidsprekers aan de voorzijde en ondersteuning voor Dolby Atmos<sup>®</sup> geven je het meeslepende gevoel van een bioscoopbezoek.

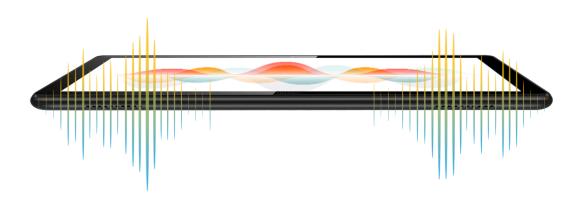




### Dubbele luidsprekers, indrukwekkend geluid

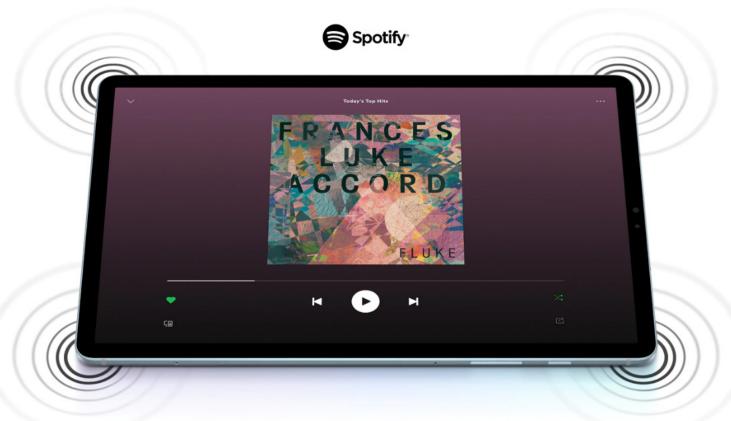
De dubbele luidsprekers van de HUAWEI MediaPad T5 produceren een hoogwaardig en robuust geluid voor jouw favoriete muziek. De HUAWEI Histen audiotechnologie maakt het geluid rijker, waardoor je een indrukwekkend bioscoopgeluid krijgt.

#### • HUAWEI histen



## Relax met schitterend beeld en geluid

Het nagenoeg randloze sAMOLED-display heeft een 10,5" 2560x1600 WQXGA-scherm, 287 ppi en een beeldverhouding van 16:10, wat ideaal is voor urenlang kijken en lezen. Ga helemaal op in je content met vier luidsprekers die een ongekend geluid geven in zo'n dunne body.





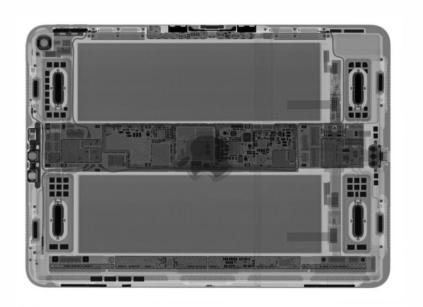








- Let's remove those speakers, shall we?
- That's easier said than tear-done. The housings are carved right into the aluminum case, and were clearly never meant to be removed.
   Digging them out takes a ton of heat and willpower.
  - The tweeters come out without a fight but the woofer drivers are pretty much toast hope they're made of never-fail-ium!
- Hiding within the speaker chamber; more magnets! If we had a nickel for every magnet in here, we could melt them all down and make a giant novelty nickel.







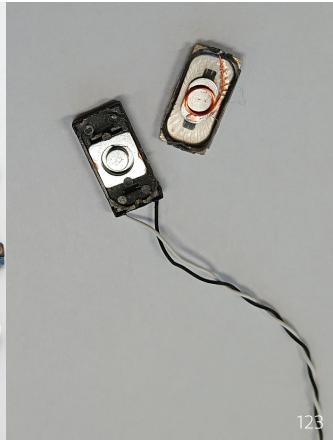


- With each passing year, Apple seemingly gets closer to realizing its dream of selling a blank slab of glass with its logo on the back.
- It's a good thing we've got X-rays on tap from Creative Electron, or this would just look like a black rectangle.
- As always, the darkest areas in the X-ray image represent dense materials that absorb more Xrays—usually magnets, such as those used in speakers and for clip-on accessories.
- We're seeing *considerably* more of those than usual here.









### 8.4 Oled screens

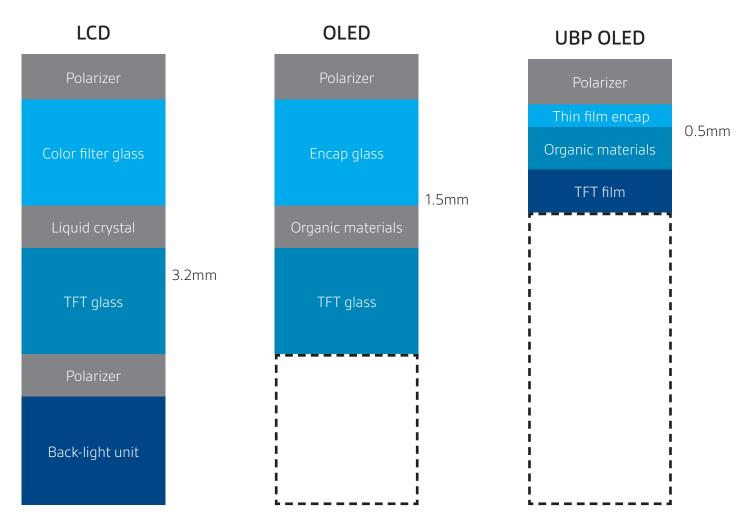
With the transition from LCD screens to Oled screens, the back-light unit in displays was eliminated. This meant a decrease in thickness, which is shown in the top image on the right. A second advantage was the lowering of energy consumption with the use of Oled screens. In an LCD screen, the colour black requires the pixels to be on. An Oled screen turns its pixels off to create the colour black, which is much more energy saving. In the current smartphones and tablets, the Oled screen is protected by a glass layer and supported with another glass layer. The protective layer prevents the screen from being scratched or dented.

A new type of Oled screen, the foldable Oled, the glass layers are removed, and mainly plastic is used. This change reduces the thickness even further and allows the screen to be bend. A downside from primarily using plastic is that now the screen is less resistant to scratches. From the available data, it is unclear how the foldable Oled displays are supported. This can either be done with the frame of the tablet itself, and the screen is glued onto this frame. Or there is another support layer added. It is quite difficult to gather this information, as this technology is quite new. Manufacturers want to prevent their competition from copying their screens, so they share no information.

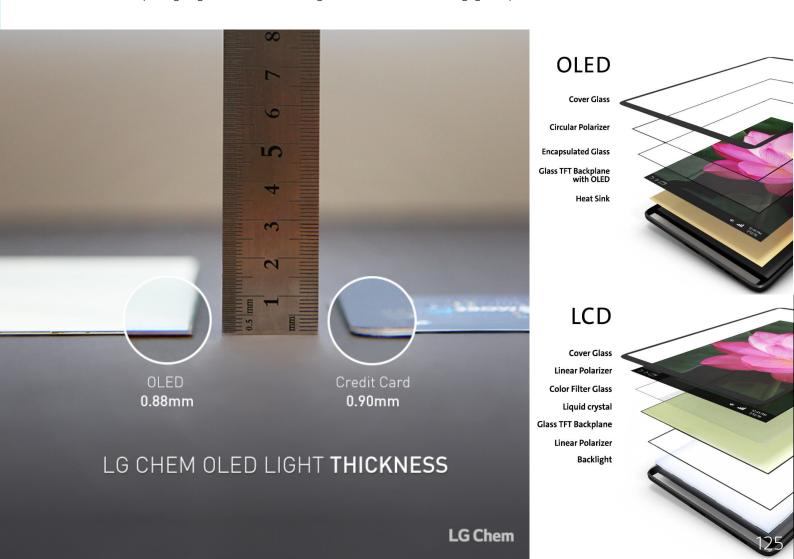
#### MAIN TAKEAWAYS:

- The average Oled screen is expected to be between 1mm and 0.5mm thick.
- · It is unclear what the composition of the Oled screen will be, this can be glass or mainly plastic.
- For the foldable Oled screen a stiff structure underneath might be necessary to support the screen.





https://gadgetstouse.com/blog/2013/04/23/samsung-galaxy-note-3-rumors/



### 8.5 Sony Surface Audio

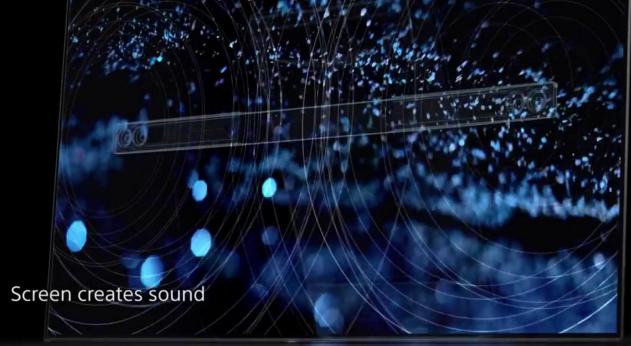
When searching for implementations of DML's in consumer products the most recent product that was found was Sony's surface audio and surface audio+. The intention for Sony with this type of sound setup is to let the sound come straight from the television instead of the bottom and keep the television as thin as possible in combination with the already thinner Oled screen. This technique is developed by LG, but none of LG's televisions have been implemented with this speaker system (yet). It is expected that somewhere in 2020 LG might put a television on the market with this technology, as they have been showcasing it at CES.

This approach to television speakers eliminates the use of sound bars and creates a front-facing audio experience. User reviews from the Sony television state that the audio seems to be moving along the screen, and that the audio comes from the object on the screen. This indicates that it is possible to have a left and a right speaker, and maybe even create more specific locations. The reviews also state that the vibrations for the audio are almost invisible. In some cases the light reflections on the screen can vibrate slightly, but when there are no reflections you cannot notice the vibrating screen.

LG's technology uses multiple coil exciters that are placed behind the screen to let it vibrate. Sony uses these exciters in two places in their older televisions, but the newer version uses three. The newer version has an exciter on either side and one in the middle. Besides the exciters the television also has a (sub)woofer installed to reach the lower frequencies. It is unclear what the design rules were for designing the television. The found 3/5 rule in literature was not followed in the placement for the exciter. The only design rule that Sony states is how the television should be mounted on the wall. The moving air cannot be obstructed by an overhanging wall or surface, and the television has to be placed a certain distance from the wall, ceiling and floor.

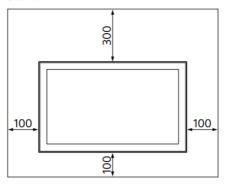
#### MAIN TAKEAWAYS:

- It is possible to use exciters behind screens in a consumer product, Sony and LG show this with their televisions.
- Placement according to the 3/5 rule is not always needed, there are other possible design rules for placement.
- The screen is able to produce front-facing audio, with the help from a (sub)woofer in the stand or back of the television.
- The exciters that are used are coil-based. These exciters give stronger vibrations which creates louder audio and possibly lower frequencies.
- The moving air around the television should not be blocked as this could influence the audio.



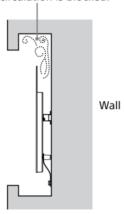
Allow for suitable clearance between the TV and the ceiling and protruding parts of the wall as shown below.

Unit: mm

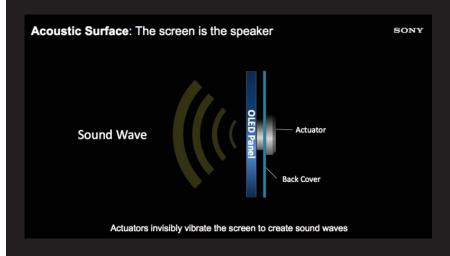


- To ensure proper ventilation and prevent the collection of dirt or dust:
  - Do not lay the TV set flat, install upside down, backwards, or sideways.
- Do not place the TV set on a shelf, rug, bed or in a closet.
- Do not cover the TV set with a cloth, such as curtains, or items such as newspapers, etc.
- Do not install the TV set as shown below.

#### Air circulation is blocked.

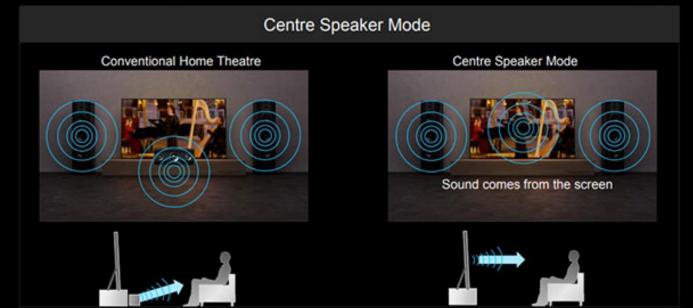






### Sound Technology: Acoustic Surface Audio+™

Acoustic Surface Audio-



### 8.6 Industry contact

#### MAIN TAKEAWAYS

- The first step in creating good sound starts with the source itself, meaning that the structure of the speaker has to be perfected. The second step would be to use DSP to level the outcome to a satisfactory level; this can be done after everything has been tried with the structure of the speaker.
- Filters for DSP can be automatically generated, but you still need to do measurements after and make adjustments based on those results. This can be done in real-time with the right equipment.
- For this first exploration, the miniDSP will be sufficient enough to test the possibility of DSP for Aito's system.
- Both listening and measurements are essential in the process of creating a good speaker
- The assumption that people will adjust to certain sounds can be made and could also be used for the new setup.
- The amplifier and digital processor together would cost around 5 euro. For a piezoelectric amplifier, the cost could go up due to different voltage requirements and the fact that it probably has to be custom made.
- A different approach to switching between haptics and audio has to be found as transistors for every individual piezoelectric disc will be too expensive in an amplifier. This could be solved by creating one system for both audio and haptics; in this system, the transistors can be used for both purposes.
- Edge placement of the exciters would be an option if the back placement of the piezoelectric discs fails. However, this would require a different type of piezoelectric element.
- The lower frequency range is likely caused by the size of the panels.
- Glass seems to be a material that can be used for a panel speaker, but there is no data on what the frequency response of this material is.
- The first step in designing a speaker system for a laptop or tablet is determining what the experience should be.
- The second step is designing the speaker with the given constraints by the designer, which is often a place that is left and not particularly ideal for the audio.
- The third step is staying within budget; a "good" graded speaker system can cost around 5 dollars. This system includes the speaker drivers and the needed amplifier with DSP.
- There is a grading system that is used to identify how well speakers from various manufacturers are performing.
- A stereo setup needs a minimal distance between the speaker drivers to be perceived as stereo output.
- The standard speaker drivers require 2W from the amplifier to produce audio.
- DML's and piezoelectric speakers are explored behind closed doors throughout the industry, as this technology could give front-facing audio without cuts in the screen.
- DSP filters might not work on piezoelectric speakers as they respond differently to audio input.
- The industry seems interested in a DML system with piezoelectrics as it allows front-facing audio with a minimal thickness.

### 8.7 Initial user test approach

#### Research questions

- How do the users perceive the music and voice audio from the new piezoelectric speaker(s) compared to the existing solutions?
- How do the users perceive the audio from the new piezoelectric speakr(s) compared to each other?

#### Method

#### setup

The research should be done in a quiet room with minimal noises from outside the room. Inside the room a table will be placed with one side for the participant and the other for the researcher. On the side of the participant a laptop will be placed on which the participant can fill in the questionnaire about perceived audio of 7 different setup for personal mobile device speakers. The setups are 1 tablet, 1 smartphone, 1 laptop, and four models. This number of setups is the maximum, otherwise the test will take too long to finish. The order in which the setups are presented should be randomized to ensure the order will not have any effect on the results. The participants will all be placed the same distance from the table and the setups to keep a uniform test. During the test the same voice recoding and music files will be played via the systems. The volume is set at a specific dB level and the models are connected to the same computer.

The side where the researcher will be should not be visible for the participant, as seeing the setup can alter their perception of the audio. To prevent the participant from seeing the setups a non-see-through speaker fabric is used. This fabric does not block airwaves but does obstruct the view to the other side of the table.

#### **Participants**

The ideal group of participants would be an even mix in genders and nationalities. The number of participants should be more than ten and preferably around 24 to be able to state conclusions based on a quantitative analysis. Participants will be excluded based on their hearing. Before they are invited to participate in the test, they should have performed a hearing test at home and send in these results.

#### <u>Introduction</u>

The participants will be told that they would review the speaker systems of various personal mobile devices. In this introduction they were not told that some of the speaker systems would be created by the researcher to leave them unbiased. The participants will get a cheat sheet with some audio terminology terms to help them with finding words to describe the audio. "A lexicon of audio quality" by Wilson (2015) will be the example for these words. However, due to the fact probably most participants speak Dutch, they might not understand the words correctly. Therefore, the words will be translated to give them a better understanding what these words mean. In this translation no negative or positive description should be given to these words, the translation should be neutral. They are allo-wed to use a cheat sheet with the translation of these words during the whole test.

#### <u>Data</u>

The data that is gathered with this test includes negative and positive descriptions of the audio and an overall audio quality rating. The rating is given on a scale from 1 to 10 and is filled in for all the setups. The descriptions have to be filled into two separate boxes, one for the positive descriptions and another for the negative wordings. The results from the grading will be turned into an average grade and the words will be visualized into word clouds.

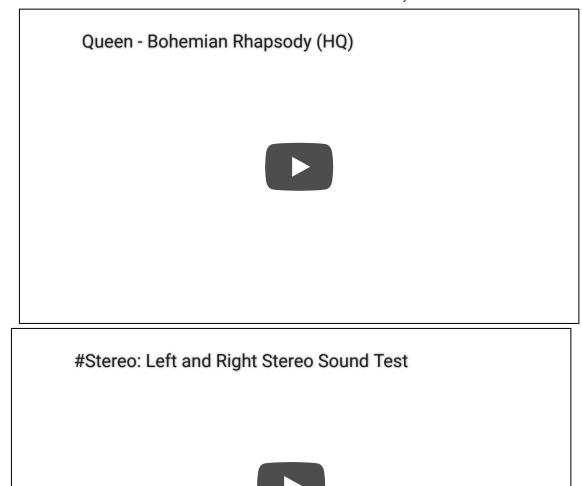
### 8.8 Online survey design



#### **Basic info**

Thank you for participating in this research about expectations for speakers in personal mobile devices. With personal mobile devices we mean either laptops, smarphones or tablets. This research will take approximately **15 to 30 minutes**, based on the amount of devices you participate with.

To participate in this survey we want you to have access to at least two (but preferably all) of the following mobile devices: a tablet, laptop, portable speaker and/or smartphone. These devices are needed to watch video's on YouTube on to rate the audio quailty of each seperate device. The video's you will use during this survey are the following:



These video's will also be available for the related questions, but only for the device you take the survey on. For your other devices we recommend you to use the titel of the video to find it on YouTube, scan the QR code or type the following links in your browser:

- https://www.youtube.com/watch?v=Vt4CEfMTLJc " <u>Queen - Bohemian Rhapsody (HQ)</u> "
- https://www.youtube.com/watch?v=6TWJaFD6R2s " #Stereo: Left and Right Stereo Sound Test "

It is advised to test the video's on all devices before you continue with the survey and to make sure you are in an area in which you can play the audio at a audible level. The audio should be played through the speakers of the device itself, so not trough headphones or external speakers that are connected to the device.

All the information that is gathered in this survey will be kept confidential and your results are anonymous, non of these results can be linked back to you.

State the devices you have access to to use during this research.

Smartphone

Portable speaker

Laptop

**Tablet** 

Which <u>brand</u> and <u>type</u> of tablet do you own? (if you have multiple tablets only <u>state the one you will be using</u> during this research)

How would you rank your tablet compared to other tablets on the market when you bought the tablet?

High-end tablet

Mid-range tablet
Low-end tablet
In which year did you buy your tablet?
Which <b>brand</b> and <b>type</b> of smartphone do you own? (if you
have multiple smartphones only state the one you will be
<u>using</u> during this research)

How would you rank your smartphone compared to other smartphones on the market when you bought the smartphone?

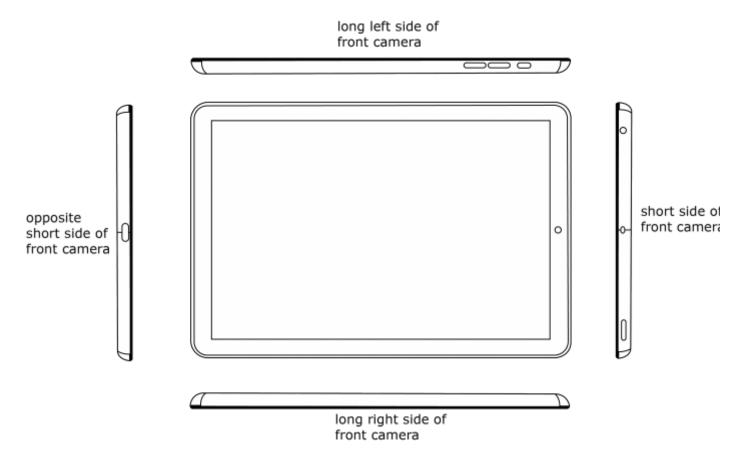
High-end smartphone Mid-range smartphone Low-end smartphone

Which <u>brand</u> and <u>type</u> of portable speaker do you own? (if you have portable speakers only <u>state the one you will be using</u> during this research)
How would you rank your portable speaker compared to other portable speakers on the market when you bought the portable speaker?
High-end laptop Mid-range laptop Low-end laptop
In which year did you buy your portable speaker?

#### **Tablet questions**

Indicate in which area the speakers of your tablet are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and

you can move it by pressing and holding down while moving the dot.



Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch? v=6TWJaFD6R2s )
- By typing the title in the search bar (<u>#Stereo: Left and Right Stereo Sound Test</u>)
- By scanning the QR code



Or with by playing the video



Mono sound

Stereo sound

The sound changes with the orientation of the device

Did you take the speakers and sound quality into acount when buying your tablet?

Yes

Maybe / I can't remember

No

Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the tablet, external speakers connected to the tablet or headphones that are connected to the tablet via either bluethooth or cable.

	I would play the audio via the speaker of my tablet	I would play the audio from headphones connected to my tablet	I would play the audio from external speakers connected to my tablet
Watching YouTube	0	0	
Browsing social media (Facebook, Instragram, etc)	0	0	0
Listening to music	0	0	0
Watching Netflix or online television			
(Video) calling	0	0	0

# What is the reason for your choice in setup **when watching YouTube**?

I don't want to bother other people

I don't want other people to bother me

I can hear the audio better

The sound quality is better

Too much hassle to get another speaker or headphone

The sound quality is good as it is without the need for extra devices

-2020	Qualtrics Survey Software
Other	
\\\  \  \  \  \  \  \  \  \  \  \  \  \	
social me	e reason for your choice in setup when <b>browsi</b> <b>dia</b> ?
I don't want to	bother other people
I don't want of	ther people to bother me
I can hear the	audio better
The sound qua	lity is better
Too much hass	sle to get another speaker or headphone
The sound qua	lity is good as it is without the need for extra devices
Other	
What is the	o reason for your choice in cotun when <b>listenir</b>
to music?	e reason for your choice in setup when <u>listenir</u>
	bother other people
	ther people to bother me
I can hear the	
The sound qua	
	sle to get another speaker or headphone
·	llity is good as it is without the need for extra devices
Other	
The second secon	

# What is the reason for your choice in setup when <u>watching</u> Netflix or online television?

I don't want to bother other people

I don't want other people to bother me

I can hear the audio better

The sound quality is better

Too much hassle to get another speaker or headphone

The sound quality is good as it is without the need for extra devices

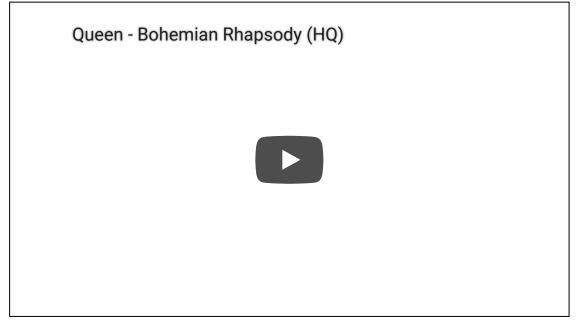
r

After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar (<u>Queen Bohemian</u> <u>Rhapsody (HQ)</u>)
- By scanning the QR code



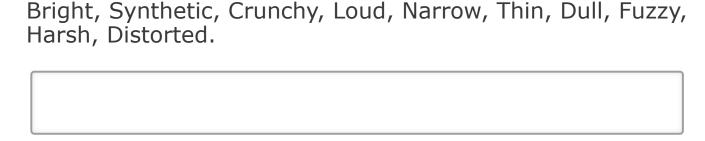
Or with by playing the video



	Excellent	Good	Average	Poor	Terrible
Audio quality	0	0	0	0	0

Describe **positive aspects** about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

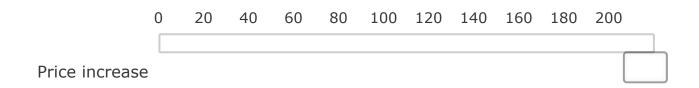
Describe <u>negative aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive,



If you could change anything about the sound performance of your tablet what would it be? If you would not change anything you can leave this field blank.



I would pay ... dollar/euro more for a tablet to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

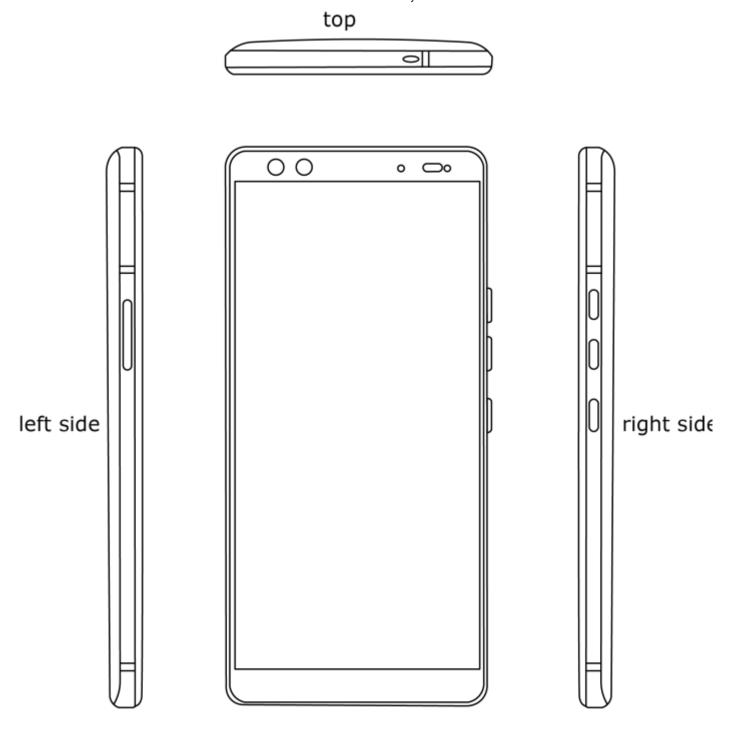


I would be willing to choose a tablet that is ... milimeter (1 mm is 0.04 inch) thicker than my current tablet to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker tablet for a better sound performance set the slider to 0.

#### **Smartphone questions**

increase

Indicate in which area the speakers of your smartphone are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 2 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



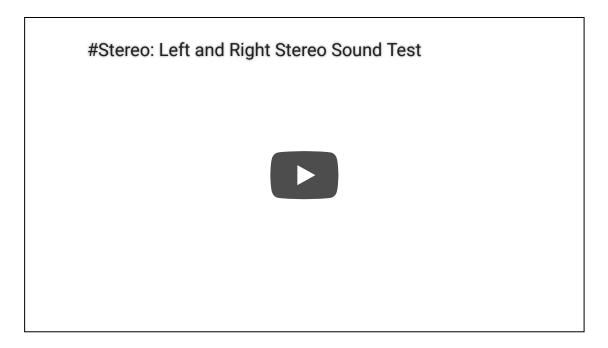
Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

bottom

- The stereo test link ( https://www.youtube.com/watch? v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



Or with by playing the video



Mono sound

Stereo sound

The sound changes with the orientation of the device

Did you take the speakers and sound quality into acount when buying this smartphone?

No

Yes

Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the smartphone, external speakers connected to the smartphoneor headphones that are connected to the smartphonevia either bluethooth or cable.

	I would play the audio via the speaker of my smartphone	I would play the audio from headphones connected to my smartphone	I would play the audio from external speakers connected to my smartphone
Watching YouTube	0	0	0
Browsing social media (Facebook, Instragram, etc)	0	0	
Listening to music	0	0	0
Watching Netflix or online television	0	0	
(Video) calling	0	0	0

# What is the reason for your choice in setup when **watching YouTube**?

I don't want to bother other people
I don't want other people to bother me
I can hear the audio better
The sound quality is better
Too much hassle to get another speaker or headphone
The sound quality is good as it is without the need for extra devices
Other
What is the reason for your choice in setup when <b>browsing</b> social media?
I don't want to bother other people I don't want other people to bother me
I can hear the audio better

The sound quality is good as it is without the need for extra devices

Too much hassle to get another speaker or headphone

The sound quality is better

Other

What is the reason for your choice in setup when <u>listening</u> to music?

2020 Qualified out to y continue
I don't want to bother other people
I don't want other people to bother me
I can hear the audio better
The sound quality is better
Too much hassle to get another speaker or headphone
The sound quality is good as it is without the need for extra devices
Other
What is the reason for your choice in setup when <u>watching</u> <u>Netflix or online television</u> ?
I don't want to bother other people

I don't want other people to bother me

I can hear the audio better

The sound quality is better

Too much hassle to get another speaker or headphone

The sound quality is good as it is without the need for extra devices

Other

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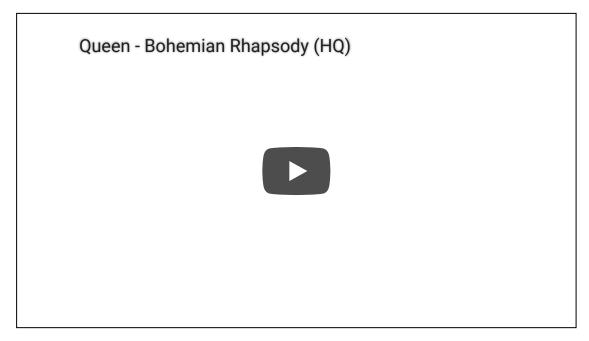
After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )
- By typing the title in the search bar (<u>Queen Bohemian</u> <u>Rhapsody (HQ)</u>)

• By scanning the QR code



• Or with by playing the video



	Excellent	Good	Average	Poor	Terrible
Audio quality	0	0	0	0	0

Describe **positive** aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.



Describe <u>negative</u> aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.



If you could change anything about the sound performance of your smartphone what would it be? If you would not change anything you can leave this field blank.



I would pay ... dollar/euro more for a smartphone to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

0 20 40 60 80 100 120 140 160 180 200

Price increase

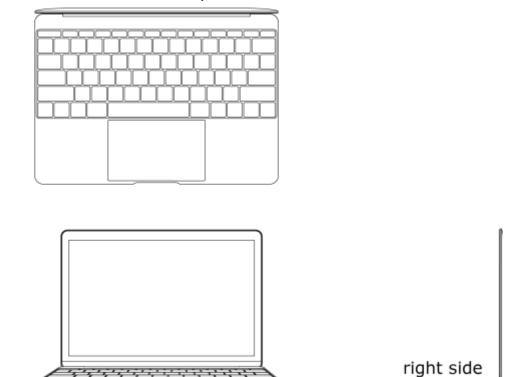
I would be willing to choose a smartphone that is ... milimeter (1 mm is 0.04 inch) thicker than my current smartphone to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker smartphone for a better sound performance set the slider to 0.



#### **Laptop questions**

Indicate in which area the speakers of your laptop are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

left side



Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch? v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



• Or with by playing the video



Mono sound

Stereo sound

The sound changes with the orientation of the device

Did you take the speakers and sound quality into acount when buying this laptop?

Yes

Maybe / I can't remember

No

Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the laptop, external speakers connected to the laptop or headphones that are connected to the laptop via either bluethooth or cable.

	I would play the audio via the speaker of my laptop	I would play the audio from headphones connected to my laptop	I would play the audio from external speakers connected to my laptop
Watching YouTube			
Browsing social media (Facebook, Instragram, etc)			
Listening to music			
Watching Netflix or online television			0
(Video) calling	0	0	0

# What is the reason for your choice in setup when **watching YouTube**?

I don't want to bother other people

I don't want other people to bother me

I can hear the audio better

The sound quality is better

Too much hassle to get another speaker or headphone

The sound quality is good as it is without the need for extra devices

-2020	Qualtrics Survey Software	
Other		
What is the reas social media?	on for your choice in setup when <b>brov</b>	<u>vsing</u>
I don't want to bother	other people	
I don't want other peop		
I can hear the audio be		
The sound quality is be	etter	
Too much hassle to get	t another speaker or headphone	
The sound quality is go	ood as it is without the need for extra devices	
Other		
		J
VA/In a Life Albert con a se	and Carrier and a land to a state of the second and 12 and a	
to music?	on for your choice in setup when <u>liste</u>	<u>ning</u>
I don't want to bother	other people	
I don't want other peop	ple to bother me	
I can hear the audio be	etter	
The sound quality is be	etter	
Too much hassle to get	t another speaker or headphone	
The sound quality is go	ood as it is without the need for extra devices	
Other		

## What is the reason for your choice in setup when **watching Netflix or online television**?

I don't want to bother other people

I don't want other people to bother me

I can hear the audio better

The sound quality is better

Too much hassle to get another speaker or headphone

The sound quality is good as it is without the need for extra devices

After listening to the song on your portable speaker, how of	ot
you rate the audio quality on a scale from one to five? You	l
can test this with:	

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar (<u>Queen Bohemian</u> <u>Rhapsody (HQ)</u>)
- By scanning the QR code



Or with by playing the video

Queen - Bohemian Rhapsody (HQ)	

	Excellent	Good	Average	Poor	Terrible
Audio quality	0	0	0	0	0

Describe **positive** aspects about the audio quality of your laptop. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

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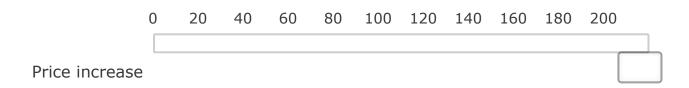
Describe <u>negative</u> aspects about the audio quality of your laptop. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide,

Aggressive, Dull, Fuzzy,		Crunchy,	Loud,	Narrow,	Thin,

If you could change anything about the sound performance of your laptop what would it be? If you would not change anything you can leave this field blank.



I would pay ... dollar/euro more for a laptop to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



I would be willing to choose a laptop that is ... milimeter (1 mm is 0.04 inch) thicker than my current laptop to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker laptop for a better sound performance set the slider to 0.



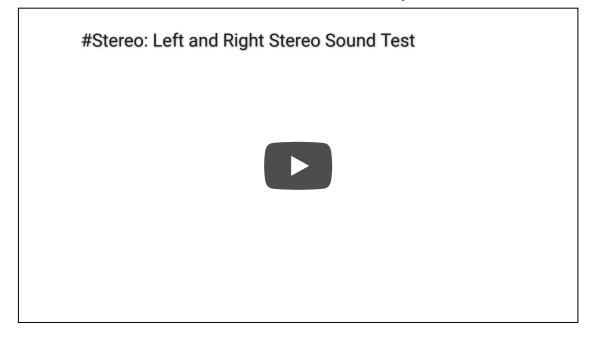
#### Portable speaker questions

Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch? v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



Or with by playing the video



Mono sound

Stereo sound

The sound changes with the orientation of the device

# Check the boxes that apply for the purchase of your portable speaker

Sound qu	ality
----------	-------

Size

Price

Design

Build in light feature

Bluethooth

Connect multiple speakers toghether

Charge phone with portable speaker

Other

None of the above

### In which scenario's do you use your portable speaker?

Play music at a party

Play music in a park/garden

Play music in everyday use

Play audio of movie or televison

Use during (video) calls

Sound during presentations or meetings

As sound improvement during laptop use

As sound improvement during tablet use

As sound improvement during smartphone use

Other

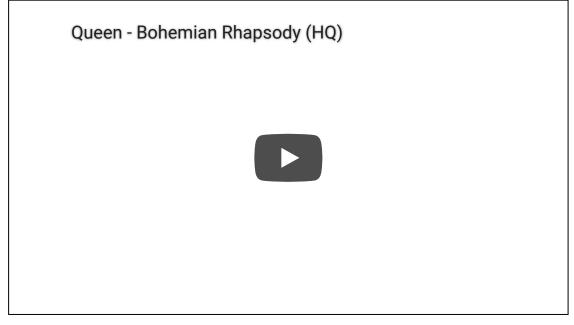
None of the above

After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( <u>Queen Bohemian Rhapsody (HQ)</u>)
- By scanning the QR code



Or with by playing the video



	Excellent	Good	Average	Poor	Terrible
Audio quality	0	0	0	0	0

Describe **positive** aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

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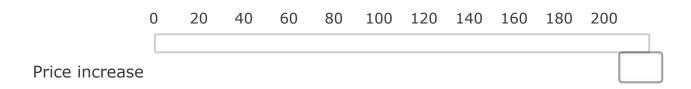
Describe <u>negative</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy,

	Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Thin, Dull, Fuzzy, Harsh, Distorted.	Narrow

If you could change anything about the sound performance of your portable speaker what would it be? If you would not change anything you can leave this field blank.



I would pay ... dollar/euro more for a portable speaker to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



I would be willing to choose a portable speaker that is ... centimeter (1 cm is 0.4 inch) thicker than my current portable speaker to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker portable speaker for a better sound performance set the slider to 0.

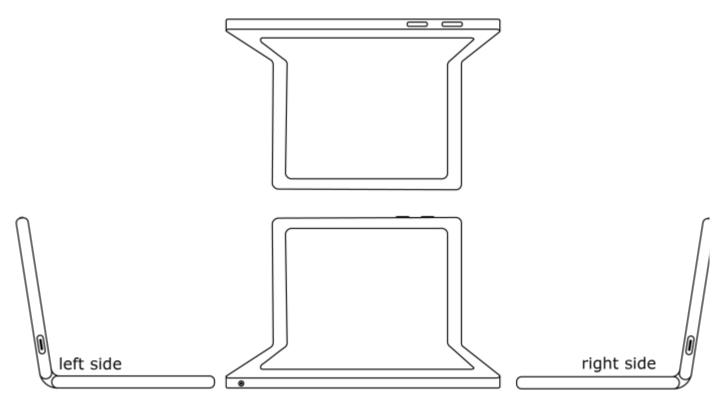


### New concept (foldable laptop)

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable laptop. This device has the same specifications as a well performing laptop but the screen covers the whole area of the laptop where the keyboard used to be. When the laptop is folded open in the laptop position the top of the screen can be compared to a regular tablet screen with another tablet screen as a keyboard. If the laptop is fully folded open it transforms in a 17 inch screen.



Where do you expect the speakers are placed in a foldable laptop? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



What would you expect from the speakers of the foldable laptop compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

What is the m to a normal la		_	foldable la	aptop co	mpared
Would the fold	dable lapto	p have a	mono or	stereo sp	oeaker
Setup?  Mono Stereo  Mono, but the sour Stereo, but the sou	_				
What would y laptop?	ou expect	the audic	quality to	o be of a	foldable
	Excellent	Good	Average	Poor	Terrible

	Excellent	Good	Average	Poor	Terrible
Audio quality	0	0	0	0	0

How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Foldable laptop

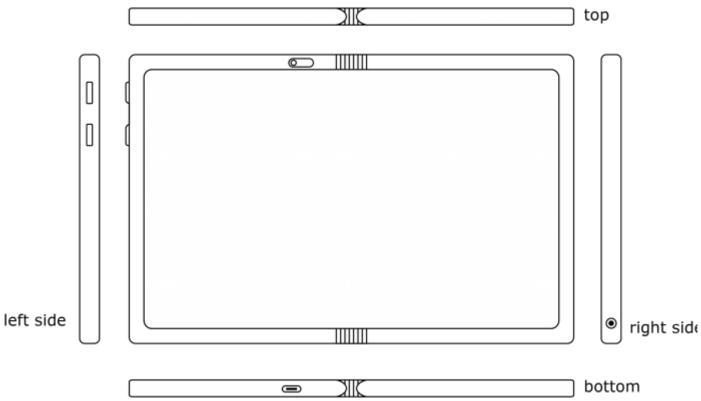
- >> Tablet
- >> Smartphone
- >> Portable speaker
- >> Laptop

#### New concept (foldable tablet)

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable tablet. This device has the same specifications as a well performing tablet but the screen can be folded in half to reduce the size. When the tablet is fully folded open the screen is 13 inches, but the tablet can also be used in a small laptop position. Each half is turned into a 9 inch screen, which can be compared to a small tablet.



Where do you expect the speakers are placed in a foldable tablet? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



What would you expect from the speakers of the foldable tablet compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...



What is the main advantage of a foldable laptop compared to a normal laptop in your eyes?



Would	the	foldable	tablet	have	a	mono	or	stereo	speal	ker
setup'	?									

Mono

Stereo

Mono, but the sound changes with the orientation of the device Stereo, but the sound changes with the orientation of the device

What would you expect the audio quality to be of a foldable tablet?

	Excellent	Good	Average	Poor	Terrible
Audio quality	0	0	0	0	0

How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

- >> Laptop
- >> Smartphone
- >> Tablet
- >> Portable speaker

Foldable tablet

### **Participant info**

Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.

Wildt Would Vou State 15 Voul Active	What would	vou state is	your gender?
--------------------------------------	------------	--------------	--------------

Male

Female

Other

I do not want to disclose this

How old are you?

What would you state is your nationality?

### How would you rate your hearing?

	Excellent	Good	Average	Poor	Terrible
Click to write Statement 1	0	0	0	0	0

### Check the boxes that apply to you

I would consider myself up to date on technology trends
I like to buy the newest personal mobile devices when they are released
Before this survey I was already familiar with foldable tablets and laptops

#### **End**

Is there anything you would like to let us know either about the topic of the survey or the survey itself? If not you can submit the survey by clicking on next button.

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For SurveyCircle users (www.surveycircle.com): The Survey Code is: G3LH-YBVM-Y719-SWNU or click the following link: <a href="https://www.surveycircle.com/G3LH-YBVM-Y719-">https://www.surveycircle.com/G3LH-YBVM-Y719-</a>

<u>SWNU</u>

Powered by Qualtrics

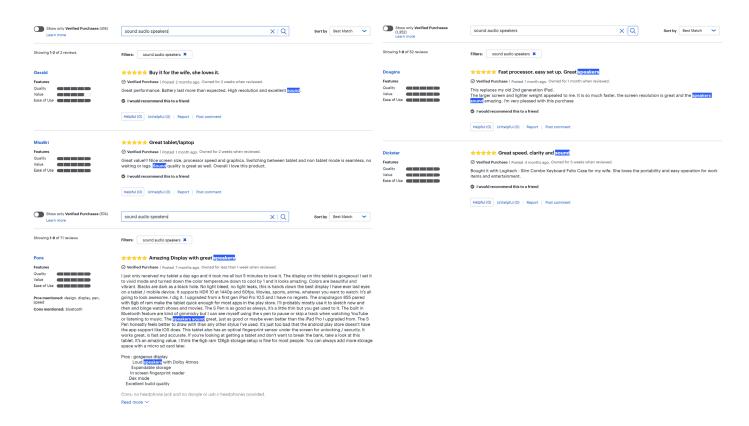
## 8.9 Tablet purchase collage

When looking at the filtering options there is not option to filter for audio quality on Dutch sites. For the website Tweakers, which is used to compare electronic devices, and Coolblue, a well know online electronic store; there is no filter option regarding audio. Bol.com, the Dutch variant of Amazon, does have an option to filter on type of use. For example "watching series and film", but it is not clear if this means the filter will search for a large screen with a high resolution or also takes the sound quality into account. Best Buy, a large (online) electronic store in the United States of America, does offer a filter for "sound quality" and "speakers". This filter is based on how other customers have rated the tablet on these aspects. When looking at the reviews regarding audio on Best Buy, only a small percentage acknowledges the audio or speakers. For the Apple iPad Pro this is 3.8% and for the Samsung Tab S6 this is 11.8%. It is uncertain how many people would actually use this filter and it is also hidden. Customers have to first scroll through the filter options and open an extra box for the section "customers rated highly for'.

There is also no specification added to the list about what type of speakers are installed or how many. This type of information has to be looked for on the website of the brand itself. And mostly the only information the brand states about the speaker system is how many speakers there are and what type of audio enhancing software is used, such as Dolby Atmos. The exception is Microsoft, they have added also the wattage of their speaker system to their specifications.

#### MAIN TAKEAWAYS:

- There are no clear filtering options to select devices based on audio quality when shopping online.
- The online stores do not offer clear explanations on the audio performance of the speaker system of tablets.
- Companies only acknowledge the amount of speakers and experience of these speakers in their advertisement on their own websites.
- Only a few customers acknowledge the audio quality of devices that focussed on a high quality audio experience that should compete with laptops.



Recensies

#### Technische specificaties

Scenario's	Veelzijdige 2-in-1-laptop voor werken en spelen op jouw manier, winkelen, bankieren, schrijven op het scherm en Netflix streamen.
Afmetingen	11,5" x 7,9" x 0,33" (292 mm x 201 mm x 8,5 mm)
Beeldscherm	Scherm: 12,3 inch PixelSense™-scherm Resolutie: 2736 x 1824 (267 PPI) Beeldverhouding: 3:2 Aanraakmodus: 10-punts multi-touch
Geheugen	4 GB, 8 GB of 16 GB LPDDR4x RAM
Processor	Dual-core 10e generatie Intel® Core™ i3-1005G1-processor  Quad-core 10e generatie Intel® Core™ i5-1035G4-processor  Quad-core 10e generatie Intel® Core™ i7-1065G7-processor

Overzicht

Opslag <sup>3</sup>	Solid State Drive (SSD-)opties: 128GB, 256GB, 512GB of 1TB
Levensduur van de batterij <sup>1</sup>	De batterij gaat tot wel 10,5 uur mee bij normaal gebruik van het apparaat
Grafische weergave	Intel® UHD Graphics (i3) Intel® Iris™ Plus Graphics (i5, i7)
Aansluitingen	1 x USB-C <sup>®</sup> 1 x USB-A 3,5 mm hoofdtelefoonaansluiting 1 x Surface Connect-poort Surface Type Cover-poort <sup>4</sup> MicroSDXC-kaartlezer Compatibel met Surface Dial off-screen interaction*
Camera's, video en audio	Windows Hello-gezichtsverificatiecamera (voorzijde) Camera met 5 megapixels aan de voorkant met full HD-video-opname in 1080p Camera aan de achterkant met 8 megapixels en autofocus met Full HD- video in 1080p Dubbele far-field Studio Mics 1,6 W stereoluidsprekers met Dolby® Audio™

### **Samsung Galaxy** Tab S6 Lte

+ book cover a 69.99,-



Alle tablets



Populaire merken Type gebruik Apple Dagelijks gebruik Samsung Films & Series kijken Ook onderweg online Huawei Lenovo Zware games spelen Foto's bewerken Kurio

Voor kinderen

Schermgrootte Klein (tot 8 inch)

Gemiddeld (8 tot 10

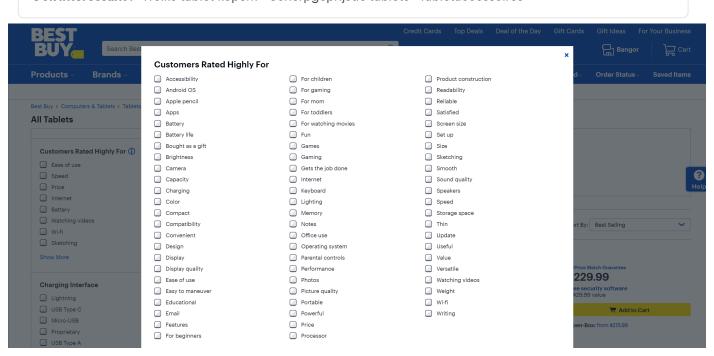
inch)

Groot (10 inch en groter)

Besturingssysteem

**Android** iOS (Apple) Windows

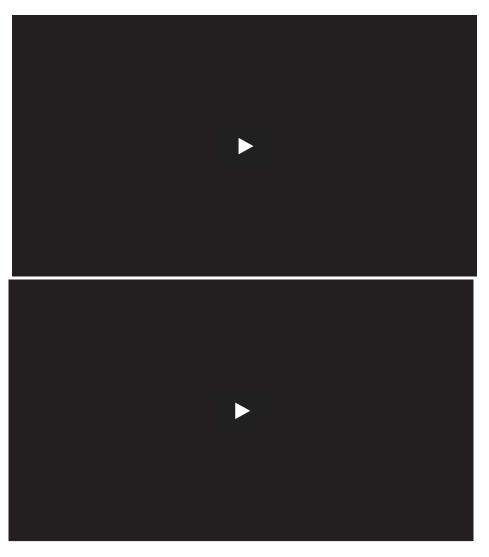
Ook interessant: Welke tablet kopen? Scherpgeprijsde tablets Tabletaccessoires



## 8.10.1 User test results participant 1

*Introduction.* Thank you for participating in this research about expectations for speakers in personal mobile devices. With personal mobile devices we mean either laptops, smarphones or tablets. This research will take approximately **15 to 30 minutes**, based on the amount of devices you participate with.

To participate in this survey we want you to have **access to at least two** (but preferably all) of the following mobile devices: a **tablet**, **laptop**, **portable speaker and/or smartphone**. These devices are needed to watch video's on YouTube on to rate the audio quailty of each seperate device. The video's you will use during this survey are the following:



These video's will also be available for the related questions, but only for the device you take the survey on. For your other devices we recommend you to use the titel of the video to find it on YouTube, scan the QR code or type the following links in your browser:

- https://www.youtube.com/watch?v=Vt4CEfMTLJc " Queen Bohemian Rhapsody (HQ) "
- https://www.youtube.com/watch?v=6TWJaFD6R2s " #Stereo: Left and Right Stereo Sound Test "

It is advised to test the video's on all devices before you continue with the survey and to make sure you are in an area in which you can play the audio at a audible level. The audio should be played through the speakers of the device itself, so not trough headphones or external speakers that are connected to the device.

All the information that is gathered in this survey will be kept confidential and your results are anonymous, non of these results can be linked back to you.

Devices used. State the devices you have access to to use during this research.

✓ Laptop
☐ Portable speaker
Tablet brand. Which brand and type of tablet do you own? (if you have multiple tablets only state the one you will be using during this research)
This question was not displayed to the respondent.
Q55. How would you rank your tablet compared to other tablets on the market when you bought the tablet?
This question was not displayed to the respondent.
Q74. In which year did you buy your tablet?
This question was not displayed to the respondent.
Smartphone brand. Which <u>brand</u> and <u>type</u> of smartphone do you own? (if you have multiple smartphones only <u>state the one you will be using</u> during this research)
Xiaomi
<ul> <li>bought the smartphone?</li> <li>High-end smartphone</li> <li>Mid-range smartphone</li> <li>Low-end smartphone</li> </ul>
Q75. In which year did you buy your smartphone?
2018
Laptop brand. Which brand and type of laptop do you own? (if you have multiple laptops only state the one you will be using during this research)
Lenovo
Q57. How would you rank your laptop compared to other laptops on the market when you bought the laptop?
High-end laptop
○ Mid-range laptop
○ Low-end laptop
Q76. In which year did you buy your laptop?
2017

Smartphone

Q102. Which <u>brand</u> and <u>type</u> of portable speaker do you own? (if you have portable speakers only <u>state</u> <u>the one you will be using</u> during this research)

This question was not displayed to the respondent.

Q103. How would you rank your portable speaker compared to other portable speakers on the market when you bought the portable speaker?

This question was not displayed to the respondent.

Q104. In which year did you buy your portable speaker?

This question was not displayed to the respondent.

Speaker position. Indicate in which area the speakers of your tablet are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

This question was not displayed to the respondent.

Q9. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar (#Stereo: Left and Right Stereo Sound Test)
- By scanning the QR code



Or with by playing the video

This question was not displayed to the respondent.

Q13. Did you take the speakers and sound quality into acount when buying your tablet?

This question was not displayed to the respondent.

Q38. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the tablet, external speakers connected to the tablet or headphones that are connected to the tablet via either bluethooth or cable.

Q61. What is the reason for your choice in setup when watching YouTube?

This question was not displayed to the respondent.

Q58. What is the reason for your choice in setup when browsing social media?

This question was not displayed to the respondent.

Q59. What is the reason for your choice in setup when listening to music?

This question was not displayed to the respondent.

Q60. What is the reason for your choice in setup when watching Netflix or online television?

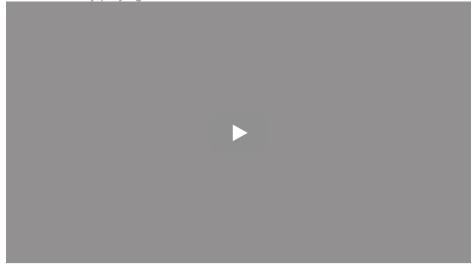
This question was not displayed to the respondent.

Q14. After listening to the song on your tablet, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ))
- By scanning the QR code



Or with by playing the video



This question was not displayed to the respondent.

*Q15.* Describe <u>positive aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q16. Describe <u>negative aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Q17. If you could change anything about the sound performance of your tablet what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

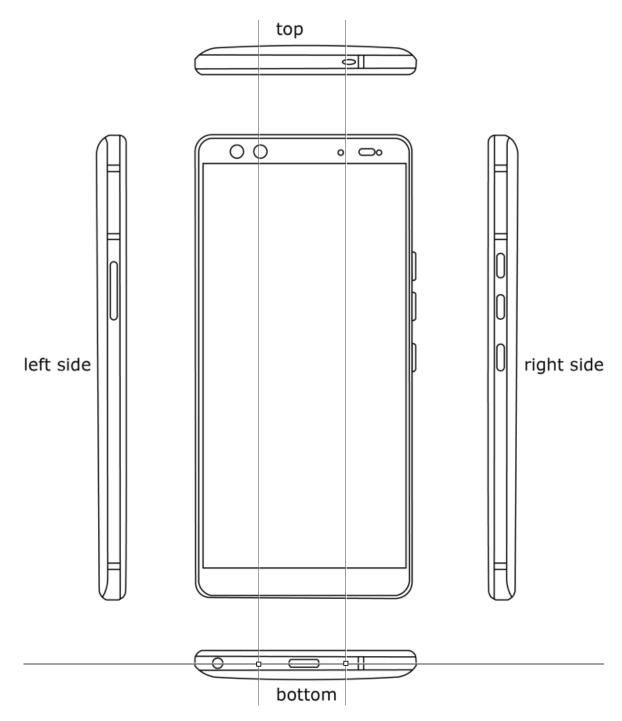
Q79. I would pay ... dollar/euro more for a tablet to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q80. I would be willing to choose a tablet that is ... milimeter (1 mm is 0.04 inch) thicker than my current tablet to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker tablet for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q25. Indicate in which area the speakers of your smartphone are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 2 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q26. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( <u>#Stereo: Left and Right Stereo Sound Test )</u>
- By scanning the QR code



Or with by playing the video



- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q27. Did you take the speakers and sound quality into acount when buying this smartphone?

- Yes
- Maybe / I can't remember
- No

Q62. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the smartphone, external speakers connected to the smartphoneor headphones that are connected to the smartphonevia either bluethooth or cable.

	I would play the audio via the speaker of my smartphone	I would play the audio from headphones connected to my smartphone	I would play the audio from external speakers connected to my smartphone
Watching YouTube	•	0	0
Browsing social media (Facebook, Instragram, etc)	•		
Listening to music			
Watching Netflix or online television		•	
(Video) calling	•		

Q63. What is the reason for your choice in setup when watching YouTube?

- I don't want to bother other people
- I don't want other people to bother me

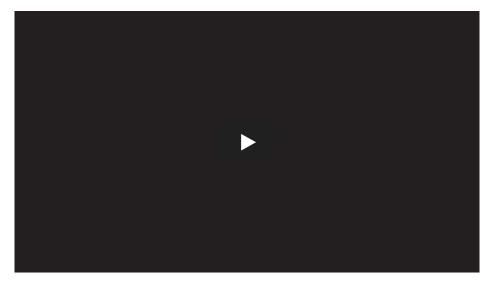
	I can hear the audio better
	The sound quality is better
•	Too much hassle to get another speaker or headphone
$\bigcirc$	The sound quality is good as it is without the need for extra devices
$\bigcirc$	Other
Q64.	What is the reason for your choice in setup when <b>browsing social media</b> ?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
$\bigcirc$	The sound quality is better
•	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
$\bigcirc$	Other
Q65.	What is the reason for your choice in setup when <u>listening to music</u> ?
	I don't want to bother other people
0	I don't want other people to bother me
	I can hear the audio better  The sound quality is better
•	The sound quality is better  Too much becale to get another angeless or headphone.
	Too much hassle to get another speaker or headphone  The sound quality is good as it is without the need for extra devices
	Other
	Outer
Q66	What is the reason for your choice in setup when watching Netflix or online television?
<b>400</b> .	That is the reason is your encise in estap when <u>hatering reasons of entire television</u> .
	I don't want to bother other people
•	I don't want other people to bother me
$\bigcirc$	I can hear the audio better
$\bigcirc$	The sound quality is better
$\bigcirc$	Too much hassle to get another speaker or headphone
$\bigcirc$	The sound quality is good as it is without the need for extra devices
	Other

Q28. After listening to the song on your smartphone, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( <u>Queen Bohemian Rhapsody (HQ)</u>)
- By scanning the QR code



• Or with by playing the video



	Excellent	Good	Average	Poor	Terrible
Audio quality					

Q29. Describe **positive** aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Loud

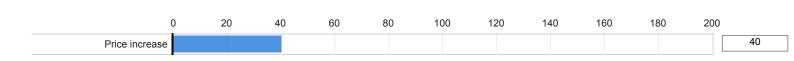
Q30. Describe <u>negative</u> aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Harsh, Synthetic,			

Q31. If you could change anything about the sound performance of your smartphone what would it be? If you would not change anything you can leave this field blank.

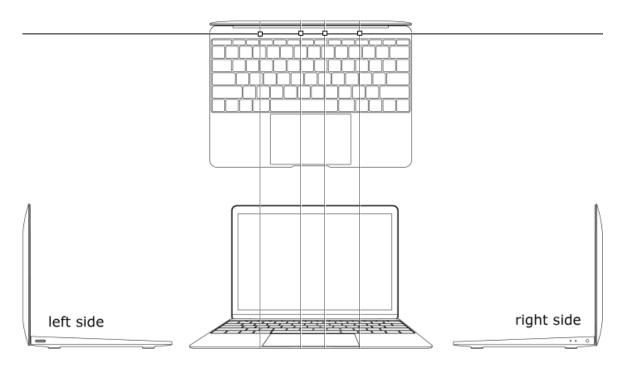


Q84. I would pay ... dollar/euro more for a smartphone to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q85. I would be willing to choose a smartphone that is ... milimeter (1 mm is 0.04 inch) thicker than my current smartphone to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker smartphone for a better sound performance set the slider to 0.

Q18. Indicate in which area the speakers of your laptop are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

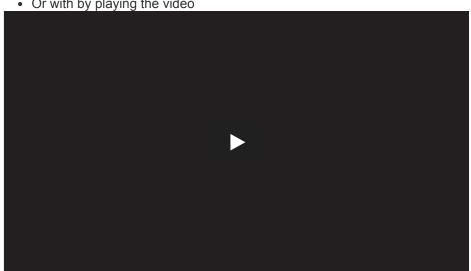


Q19. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



• Or with by playing the video



- Mono sound
- Stereo sound

Maybe / I can't remember     No			
O67 Soloet for each scope	rio which caso is most com	mon when to you want to li	iston to audio. Vou havo
Q67. Select for each scena the options to chose between headphones that are conne	en internal speakers of the	laptop, external speakers of	
	I would play the audio via the speaker of my laptop	I would play the audio from headphones connected to my laptop	I would play the audio from external speakers connected to my laptop
Natching YouTube	•	0	0
Browsing social media Facebook, Instragram, etc)	•		
Listening to music	0		•
Vatching Netflix or online	•		$\bigcirc$
elevision Video) calling	•	0	0
video) calling	•		0
Q68. What is the reason for	r vour choice in setup when	watching YouTube?	
,,,,	,,,,	<u></u>	
I don't want to bother other per	eople		
I don't want other people to be	other me		
I can hear the audio better			
<ul> <li>The sound quality is better</li> </ul>			
Too much hassle to get anoth	•		
_	it is without the need for extra device	es	
Other			
Q69. What is the reason for	r vour choice in setup when	hrowsing social modia?	
Q09. What is the reason for	your choice in setup when	biowsing social inleala:	
I don't want to bother other per	eople		
I don't want other people to be	other me		
I can hear the audio better			
<ul> <li>The sound quality is better</li> </ul>			
Too much hassle to get anoth	ner speaker or headphone		
	ner speaker or headphone it is without the need for extra device	es	
	·	es	
The sound quality is good as	·	es	
The sound quality is good as	·	es	
<ul><li>The sound quality is good as</li><li>Other</li></ul>	it is without the need for extra device		
<ul><li>The sound quality is good as</li><li>Other</li><li>Q70. What is the reason for</li></ul>	it is without the need for extra device		
The sound quality is good as Other  Q70. What is the reason for	r your choice in setup when		
<ul> <li>The sound quality is good as</li> <li>Other</li> <li>Q70. What is the reason for</li> <li>I don't want to bother other per</li> <li>I don't want other people to be</li> </ul>	r your choice in setup when		
The sound quality is good as  Other  Q70. What is the reason for  I don't want to bother other per  I don't want other people to be  I can hear the audio better	r your choice in setup when		
<ul> <li>The sound quality is good as</li> <li>Other</li> <li>Q70. What is the reason for</li> <li>I don't want to bother other pe</li> <li>I don't want other people to be</li> <li>I can hear the audio better</li> <li>The sound quality is better</li> </ul>	it is without the need for extra deviced in setup when exple other me		
The sound quality is good as  Other  Q70. What is the reason for  I don't want to bother other per  I don't want other people to ber  I can hear the audio better  The sound quality is better  Too much hassle to get anoth	it is without the need for extra deviced in setup when exple other me	listening to music?	

Q20. Did you take the speakers and sound quality into acount when buying this laptop?

O Yes

	er				
<ul><li>The sound quality is bette</li><li>Too much hassle to get a</li><li>The sound quality is good</li></ul>	er nother speaker or headph				
Too much hassle to get a  The sound quality is good	nother speaker or headph				
The sound quality is good					
	d as it is without the need f	for extra devices			
Other					
<ul> <li>21. After listening to the? You can test this will the stereo test link.</li> <li>By typing the title in By scanning the QF.</li> </ul>	ith: ( <u>https://www.youtu</u> n the search bar ( <u>Q</u>	ibe.com/watch?	v=Vt4CEfMTLJc	)	from one to
	▣				
<ul> <li>Or with by playing t</li> </ul>	the video				
or mar by playing					
	Evvellent	Out	A	Descri	Torrible
io quality	Excellent	Good	Average	Poor	Terrible
o quality	Excellent	Good	Average •	Poor	Terrible
io quality 22. Describe <b>positive</b> is field blank. As an ex nooth, Punchy, Wide, a storted.	aspects about the a	nudio quality of y words such as:	our laptop. If the Clean, Full, Stro	re are not any y	ou can leave
22. Describe <b>positive</b> is field blank. As an ex	aspects about the a	nudio quality of y words such as:		re are not any y	ou can leave
22. Describe <b>positive</b> is field blank. As an exmooth, Punchy, Wide, astorted.	aspects about the a	nudio quality of y words such as:		re are not any y	ou can leave
22. Describe <b>positive</b> is field blank. As an exmooth, Punchy, Wide, astorted.	aspects about the a	nudio quality of y words such as:		re are not any y	ou can leave
22. Describe <b>positive</b> is field blank. As an exmooth, Punchy, Wide, astorted.	aspects about the a	nudio quality of y words such as:		re are not any y	ou can leave
22. Describe positive is field blank. As an exmooth, Punchy, Wide, astorted.  Loud enough  23. Describe negative	aspects about the acample you can use Aggressive, Bright,	eudio quality of y words such as: Synthetic, Crund	our laptop. If the Clean, Full, Strochy, Loud, Narrow	re are not any yng, Clear, Spac w, Thin, Dull, Fu	you can leave ious, Deep, uzzy, Harsh,
22. Describe positive is field blank. As an exmooth, Punchy, Wide, a storted.  Loud enough  23. Describe negative is field blank. As an ex	aspects about the acample you can use Aggressive, Bright,	audio quality of y words such as: Synthetic, Crund	our laptop. If the Clean, Full, Strochy, Loud, Narrow	re are not any yng, Clear, Spac w, Thin, Dull, Fu ere are not anyng, Clear, Spac	you can leave ious, Deep, uzzy, Harsh, you can leave ious, Deep,
22. Describe positive is field blank. As an exmooth, Punchy, Wide, a storted.  Loud enough  23. Describe negative is field blank. As an exmooth, Punchy, Wide, a mooth, Punchy, Wide, Punchy,	aspects about the acample you can use Aggressive, Bright,	audio quality of y words such as: Synthetic, Crund	our laptop. If the Clean, Full, Strochy, Loud, Narrow	re are not any yng, Clear, Spac w, Thin, Dull, Fu ere are not anyng, Clear, Spac	you can leave ious, Deep, uzzy, Harsh, you can leave ious, Deep,
22. Describe positive is field blank. As an exmooth, Punchy, Wide, a storted.  Loud enough  23. Describe negative is field blank. As an ex	aspects about the acample you can use Aggressive, Bright,	audio quality of y words such as: Synthetic, Crund	our laptop. If the Clean, Full, Strochy, Loud, Narrow	re are not any yng, Clear, Spac w, Thin, Dull, Fu ere are not anyng, Clear, Spac	you can leave ious, Deep, uzzy, Harsh, you can leave ious, Deep,
22. Describe positive is field blank. As an exmooth, Punchy, Wide, a storted.  Loud enough  23. Describe negative is field blank. As an exmooth, Punchy, Wide, a mooth, Punchy, Wide, Punchy,	aspects about the acample you can use Aggressive, Bright,	audio quality of y words such as: Synthetic, Crund	our laptop. If the Clean, Full, Strochy, Loud, Narrow	re are not any yng, Clear, Spac w, Thin, Dull, Fu ere are not anyng, Clear, Spac	you can leave ious, Deep, uzzy, Harsh, you can leave ious, Deep,
22. Describe <b>positive</b> is field blank. As an exmooth, Punchy, Wide, astorted.	aspects about the a	nudio quality of y words such as:		re are not any y	ou can leavious, Deep,

186

Q71. What is the reason for your choice in setup when watching Netflix or online television?

Q24. If you could change anything about the sound performance of your laptop what would it be? If you would not change anything you can leave this field blank.

bass, overal better quality		

Q82. I would pay ... dollar/euro more for a laptop to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q83. I would be willing to choose a laptop that is ... milimeter (1 mm is 0.04 inch) thicker than my current laptop to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker laptop for a better sound performance set the slider to 0.



Q92. Check the boxes that apply for the purchase of your portable speaker

This question was not displayed to the respondent.

Q97. In which scenario's do you use your portable speaker?

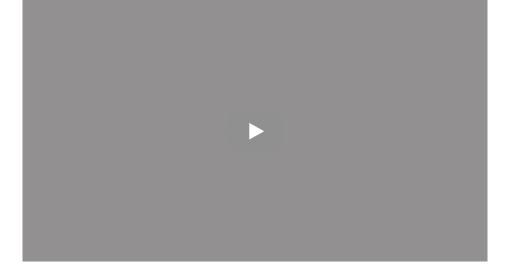
This question was not displayed to the respondent.

Q91. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



· Or with by playing the video



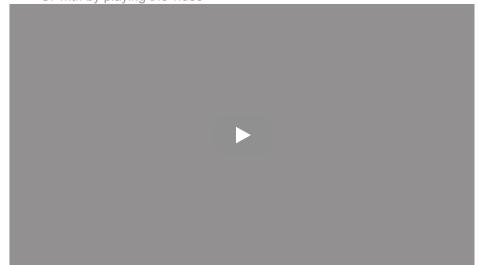
This question was not displayed to the respondent.

Q98. After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
- By scanning the QR code



Or with by playing the video



This question was not displayed to the respondent.

Q99. Describe <u>positive</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q100. Describe <u>negative</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q101. If you could change anything about the sound performance of your portable speaker what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

Q102. I would pay ... dollar/euro more for a portable speaker to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q103. I would be willing to choose a portable speaker that is ... centimeter (1 cm is 0.4 inch) thicker than my current portable speaker to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker portable speaker for a better sound performance set the slider to 0.

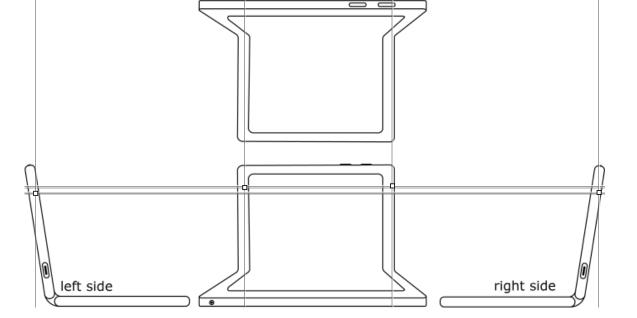
This question was not displayed to the respondent.

#### Q28.

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable laptop. This device has the same specifications as a well performing laptop but the screen covers the whole area of the laptop where the keyboard used to be. When the laptop is folded open in the laptop position the top of the screen can be compared to a regular tablet screen with another tablet screen as a keyboard. If the laptop is fully folded open it transforms in a 17 inch screen.



Q10. Where do you expect the speakers are placed in a foldable laptop? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q35. What would you expect from the speakers of the foldable laptop compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

П	I don't expect them to be better then a laptop Around the same
ı.	r don't expect them to be better them a laptop Around the same

Q77. What is the main advantage of a foldable laptop compared to a normal laptop in your eyes?

I think might be lighter. and easier to watch series in bed when you want to hold it and lay on one side.. Also easier to walk with, with a laptop you have to close is because it is bad for you screen if you walk with it open. And with a foldable it could be easier. Also when cooking and you want to read recipice, you can put it easier in a holder and take up less space.

Q36. Would the foldable laptop have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

Q73. What would you expect the audio quality to be of a foldable laptop?

	Excellent	Good	Average	Poor	Terrible
Audio quality	0		•	$\circ$	

Q37. How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

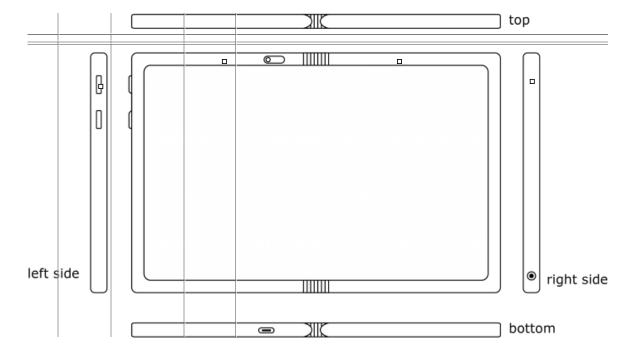
Laptop	1
Foldable laptop	2
Smartphone	3

Q45. In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable tablet. This device has the same specifications as a well performing

tablet but the screen can be folded in half to reduce the size. When the tablet is fully folded open the screen is 13 inches, but the tablet can also be used in a small laptop position. Each half is turned into a 9 inch screen, which can be compared to a small tablet.



Q46. Where do you expect the speakers are placed in a foldable tablet? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q47. What would you expect from the speakers of the foldable tablet compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Same as a regular tablet

48. Would the foldable ta	blet have a mono	or stereo spea	ker setup?		
<ul><li>Mono</li></ul>					
Stereo					
<ul> <li>Mono, but the sound change</li> </ul>	s with the orientation of	f the device			
Stereo, but the sound change	es with the orientation o	of the device			
272. What would you expe	ect the audio quali	ity to be of a fol	dable tablet?		
	Excellent	Good	Average	Poor	Terrible
idio quality			•	$\bigcirc$	
Deakers. Laptop					
Smartphone					1
Cinal priorio					
Foldable tablet					3
251. Lastly we would like t	o get some backç it cannot be liked	ground informat to you as state	ion about who yo	u are. We will k ion.	3
Q51. Lastly we would like to a	it cannot be liked	ground informat to you as state	ion about who yo d in the introduct	u are. We will k ion.	3
051. Lastly we would like to a like to some so	it cannot be liked	ground informat to you as state	ion about who yo ed in the introduct	u are. We will k ion.	3
Q51. Lastly we would like to a solution anonymous so Q31. What would you state	it cannot be liked	ground informat to you as state	ion about who yo	u are. We will k ion.	3
Q51. Lastly we would like to information anonymous so Q31. What would you state  Male Female Other	it cannot be liked	ground informat to you as state	ion about who yo	u are. We will k ion.	3
Q51. Lastly we would like to information anonymous so Q31. What would you state  Male Female	it cannot be liked	ground informat to you as state	ion about who yo	u are. We will k ion.	3
Q51. Lastly we would like to information anonymous so Q31. What would you state  Male Female Other I do not want to disclose this	it cannot be liked	ground informat to you as state	ion about who yo	u are. We will k ion.	3
Q51. Lastly we would like to information anonymous so Q31. What would you state  Male Female Other I do not want to disclose this	it cannot be liked	ground informat to you as state	ion about who yo	u are. We will k	3
Q51. Lastly we would like to information anonymous so Q31. What would you state  Male Female Other I do not want to disclose this Q32. How old are you?	it cannot be liked	to you as state	ion about who yo	u are. We will k	3
Q51. Lastly we would like to information anonymous so Q31. What would you state Male  Male  Female  Other  I do not want to disclose this Q32. How old are you?	it cannot be liked	to you as state	ion about who yo	u are. We will k	3

Q78. What is the main advantage of a foldable tablet compared to a normal tablet in your eyes?

192 Excellent Good Average Poor Terrible

Q52. C	Check the boxes that apply to you
	efore this survey I was already familiar with foldable tablets and laptops would consider myself up to date on technology trends
☐ I li	ike to buy the newest personal mobile devices when they are released
	Is there anything you would like to let us know either about the topic of the survey or the survey lf not you can submit the survey by clicking on next button.

 $\bigcirc$ 

 $\bigcirc$ 

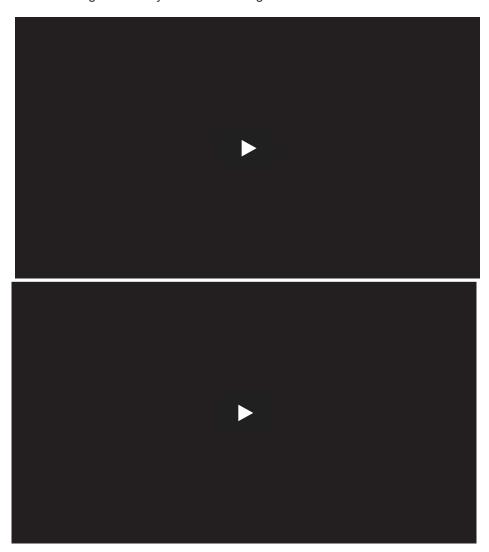
Click to write Statement 1

Q109. For SurveyCircle users (www.surveycircle.com): The Survey Code is: G3LH-YBVM-Y719-SWNU or click the following link:  $\frac{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}$ 

## 8.10.2 User test results participant 2

*Introduction.* Thank you for participating in this research about expectations for speakers in personal mobile devices. With personal mobile devices we mean either laptops, smarphones or tablets. This research will take approximately **15 to 30 minutes**, based on the amount of devices you participate with.

To participate in this survey we want you to have **access to at least two** (but preferably all) of the following mobile devices: a **tablet**, **laptop**, **portable speaker and/or smartphone**. These devices are needed to watch video's on YouTube on to rate the audio quailty of each seperate device. The video's you will use during this survey are the following:



These video's will also be available for the related questions, but only for the device you take the survey on. For your other devices we recommend you to use the titel of the video to find it on YouTube, scan the QR code or type the following links in your browser:

- https://www.youtube.com/watch?v=Vt4CEfMTLJc " Queen Bohemian Rhapsody (HQ) "
- https://www.youtube.com/watch?v=6TWJaFD6R2s " #Stereo: Left and Right Stereo Sound Test "

It is advised to test the video's on all devices before you continue with the survey and to make sure you are in an area in which you can play the audio at a audible level. The audio should be played through the speakers of the device itself, so not trough headphones or external speakers that are connected to the device.

All the information that is gathered in this survey will be kept confidential and your results are anonymous, non of these results can be linked back to you.

Devices used. State the devices you have access to to use during this research.

	Portable speaker
	let brand. Which brand and type of tablet do you own? (if you have multiple tablets only state the one will be using during this research)
Thi	s question was not displayed to the respondent.
Q <i>55</i> <b>tabl</b>	5. How would you rank your tablet compared to other tablets on the market when you bought the et?
Thi	s question was not displayed to the respondent.
Q74	f. In which year did you buy your tablet?
Thi	s question was not displayed to the respondent.
	artphone brand. Which <u>brand</u> and <u>type</u> of smartphone do you own? (if you have multiple smartphones a <u>state the one you will be using</u> during this research)
0	nePlus 3
•	High-end smartphone  Mid-range smartphone
C	
	Low-end smartphone
Q75	Low-end smartphone  5. In which year did you buy your smartphone?
	5. In which year did you buy your smartphone?
20 Lap	5. In which year did you buy your smartphone?
Lap one	5. In which year did you buy your smartphone?  1016  1016  1016  1017  1018  1019  1
Lap one	5. In which year did you buy your smartphone?  106  109  109  109  109  109  109  109
Lapone H	5. In which year did you buy your smartphone?  106  109  109  109  109  109  109  109
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Lapone H	5. In which year did you buy your smartphone?  2016  2016  2016  2016  2016  2016  2016  2016  2016  2016  2016  2016  2016  2016  2017  2018  2
Lappone  Q57  lapt	5. In which year did you buy your smartphone?  5. In which year did you buy your smartphone?  5. In which year did you buy your smartphone?  5. In which year did you buy your smartphone?  5. In which year did you buy your smartphone?  6. In which year did you buy you buy you own? (if you have multiple laptops only state the you will be using during this research)  7. How would you rank your laptop compared to other laptops on the market when you bought the op?  6. In which year did you buy you own? (if you have multiple laptops only state the you buy you have multiple laptops only state the you buy you have multiple laptops only state the you will be using during this research.
Lappone  R Q577  Lapt  Q76	5. In which year did you buy your smartphone?  1016  1016  1016  1017  1018  1019  1

Smartphone

Q102. Which <u>brand</u> and <u>type</u> of portable speaker do you own? (if you have portable speakers only <u>state</u> <u>the one you will be using</u> during this research)

This question was not displayed to the respondent.

Q103. How would you rank your portable speaker compared to other portable speakers <u>on the market when you bought the portable speaker?</u>

This question was not displayed to the respondent.

Q104. In which year did you buy your portable speaker?

This question was not displayed to the respondent.

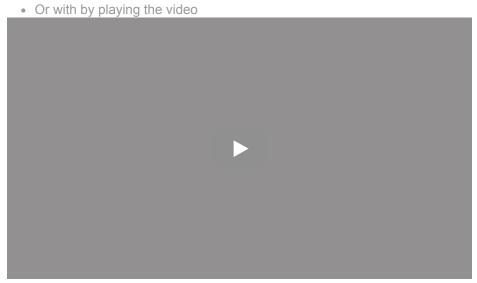
Speaker position. Indicate in which area the speakers of your tablet are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

This question was not displayed to the respondent.

Q9. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( <u>#Stereo: Left and Right Stereo Sound Test )</u>
- By scanning the QR code





This question was not displayed to the respondent.

Q13. Did you take the speakers and sound quality into acount when buying your tablet?

This question was not displayed to the respondent.

Q38. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the tablet, external speakers connected to the tablet or headphones that are connected to the tablet via either bluethooth or cable.

Q61. What is the reason for your choice in setup when watching YouTube?

This question was not displayed to the respondent.

Q58. What is the reason for your choice in setup when browsing social media?

This question was not displayed to the respondent.

Q59. What is the reason for your choice in setup when listening to music?

This question was not displayed to the respondent.

Q60. What is the reason for your choice in setup when watching Netflix or online television?

This question was not displayed to the respondent.

Q14. After listening to the song on your tablet, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
- By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

*Q15.* Describe <u>positive aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q16. Describe <u>negative aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Q17. If you could change anything about the sound performance of your tablet what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

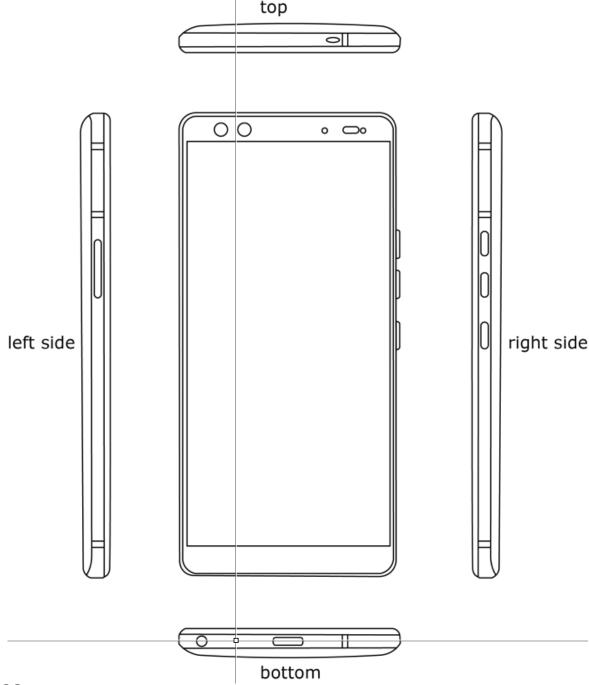
Q79. I would pay ... dollar/euro more for a tablet to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q80. I would be willing to choose a tablet that is ... milimeter (1 mm is 0.04 inch) thicker than my current tablet to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker tablet for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q25. Indicate in which area the speakers of your smartphone are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 2 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q26. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



Or with by playing the video



- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q27. Did you take the speakers and sound quality into acount when buying this smartphone?

- Yes
- Maybe / I can't remember
- No

Q62. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the smartphone, external speakers connected to the smartphoneor headphones that are connected to the smartphonevia either bluethooth or cable.

	I would play the audio via the speaker of my smartphone	I would play the audio from headphones connected to my smartphone	I would play the audio from external speakers connected to my smartphone
Watching YouTube	0	•	0
Browsing social media (Facebook, Instragram, etc)	•		
Listening to music	0		
Watching Netflix or online television	•		
(Video) calling			

Q63. What is the reason for your choice in setup when watching YouTube?

- I don't want to bother other people
- I don't want other people to bother me

I don't want to bother other people I don't want other people to bother me I can hear the audio better The sound quality is better Too much hassle to get another speaker or headphone The sound quality is good as it is without the need for extra devices Other  Q66. What is the reason for your choice in setup when watching Netflix or online television?  I don't want to bother other people I don't want other people to bother me I can hear the audio better The sound quality is better Too much hassle to get another speaker or headphone The sound quality is good as it is without the need for extra devices Other I'm on my own and I lay in bed, then my earphones are a hazzle in bed	$\bigcirc$	The sound quality is better
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in bed, then my earphones are a hazzle in bed	$\bigcirc$	The sound quality is good as it is without the need for extra devices
Q28 After listening to the song on your smartphone, how do you rate the audio quality on a scale from	•	in bed, then my earphones are a hazzle
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one to five? You can test this with:

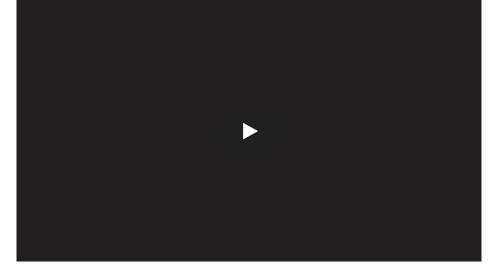
• The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)

• By typing the title in the search bar ( <a href="Queen-Bohemian Rhapsody">Queen-Bohemian Rhapsody</a> (HQ))

• By scanning the QR code

I can hear the audio better





	Excellent	Good	Average	Poor	Terrible
Audio quality					

Q29. Describe **positive** aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

ear	

Q30. Describe <u>negative</u> aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Synthetic and thin			

Q31. If you could change anything about the sound performance of your smartphone what would it be? If you would not change anything you can leave this field blank.

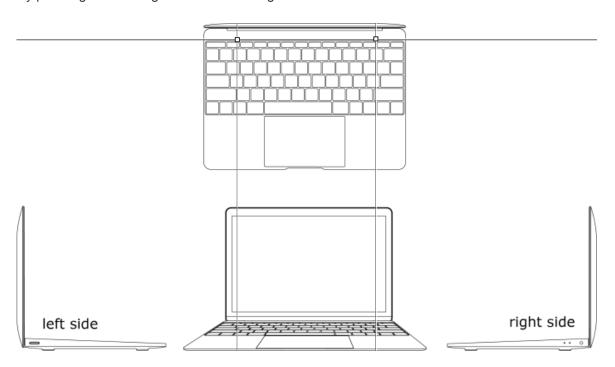


Q84. I would pay ... dollar/euro more for a smartphone to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q85. I would be willing to choose a smartphone that is ... millimeter (1 mm is 0.04 inch) thicker than my current smartphone to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker smartphone for a better sound performance set the slider to 0.

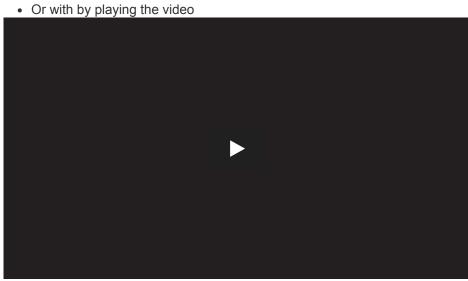
Q18. Indicate in which area the speakers of your laptop are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q19. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code





- Mono sound
- Stereo sound
- 202

<ul><li>Maybe / I can't remember</li><li>No</li></ul>			
the options to chose between	ario which case is most com een internal speakers of the nected to the laptop via eithe	laptop, external speakers of	
	I would play the audio via the speaker of my laptop	I would play the audio from headphones connected to my laptop	I would play the audio from external speakers connected to my laptop
Natching YouTube	0	•	0
Browsing social media Facebook, Instragram, etc)	0	•	0
Listening to music	•		$\bigcirc$
Natching Netflix or online	•	0	0
relevision			
Video) calling		•	0
I can hear the audio better	bother me		
<ul><li>I don't want to bother other</li><li>I don't want other people to</li></ul>			
I can hear the audio better			
<ul> <li>The sound quality is better</li> </ul>			
Too much hassle to get and	ther speaker or headphone		
<ul> <li>The sound quality is good a</li> </ul>	as it is without the need for extra devic	es	
Other			
Q69. What is the reason for	or your choice in setup when	browsing social media?	
<ul><li>I don't want to bother other</li></ul>	people		
<ul> <li>I don't want other people to</li> </ul>	bother me		
I can hear the audio better			
<ul> <li>The sound quality is better</li> </ul>			
Too much hassle to get and	other speaker or headphone		
The sound quality is good a	as it is without the need for extra devic	es	
Other			
Q70. What is the reason for	or your choice in setup when	listening to music?	
I don't want to bother other	people		
<ul> <li>I don't want other people to</li> </ul>	bother me		
I can hear the audio better			
The sound quality is better			
Too much hassle to get and	other speaker or headphone		
<ul> <li>The sound quality is good a</li> </ul>	as it is without the need for extra devic	es	
Other			

Q20. Did you take the speakers and sound quality into acount when buying this laptop?

Yes

Q71. What is the reason fo	r your choice in s	etup when wat	ching Netflix or	online televisi	on?
I don't want to bother other p	eople				
I don't want other people to be	oother me				
I can hear the audio better					
The sound quality is better					
Too much hassle to get anot	ner speaker or headpho	one			
The sound quality is good as	it is without the need for	or extra devices			
Other					
Q21. After listening to the s five? You can test this with   The stereo test link ( !   By typing the title in th   By scanning the QR of	nttps://www.youtune search bar ( Quecode	be.com/watch?	v=Vt4CEfMTLJc	)	
	Excellent	Good	Average	Poor	Terrible
Audio quality	0	•		0	
Q22. Describe <b>positive</b> as this field blank. As an exan Smooth, Punchy, Wide, Ag Distorted.  Deep, smooth, clear, spacious	nple you can use gressive, Bright, S	words such as: Synthetic, Crun	Clean, Full, Stro chy, Loud, Narro	re are not any y ng, Clear, Spac w, Thin, Dull, Fo	cious, Deep, uzzy, Harsh,
Q23. Describe <u>negative</u> as this field blank. As an exan Smooth, Punchy, Wide, Ag Distorted.	iple you can use	words such as:	Clean, Full, Stro	ng, Clear, Spac	cious, Deep,

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Crunchy for talking during video calling

Q24. If you could change anything about the sound performance of your laptop what would it be? If you would not change anything you can leave this field blank.

better sound of speak			

Q82. I would pay ... dollar/euro more for a laptop to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q83. I would be willing to choose a laptop that is ... milimeter (1 mm is 0.04 inch) thicker than my current laptop to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker laptop for a better sound performance set the slider to 0.



Q92. Check the boxes that apply for the purchase of your portable speaker

This question was not displayed to the respondent.

Q97. In which scenario's do you use your portable speaker?

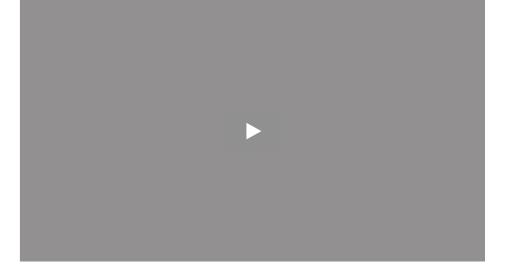
This question was not displayed to the respondent.

Q91. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



Or with by playing the video



This question was not displayed to the respondent.

Q98. After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
- By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q99. Describe **positive** aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q100. Describe <u>negative</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q101. If you could change anything about the sound performance of your portable speaker what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

Q102. I would pay ... dollar/euro more for a portable speaker to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q103. I would be willing to choose a portable speaker that is ... centimeter (1 cm is 0.4 inch) thicker than my current portable speaker to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker portable speaker for a better sound performance set the slider to 0.

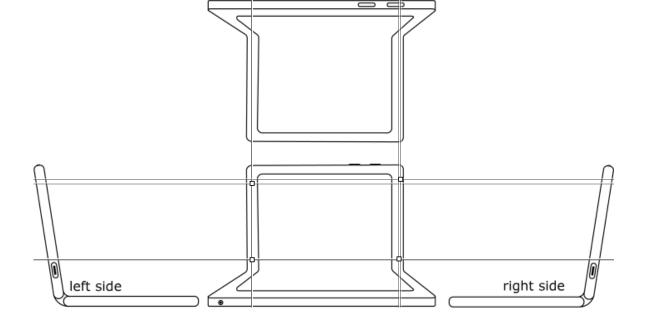
This question was not displayed to the respondent.

#### Q28.

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable laptop. This device has the same specifications as a well performing laptop but the screen covers the whole area of the laptop where the keyboard used to be. When the laptop is folded open in the laptop position the top of the screen can be compared to a regular tablet screen with another tablet screen as a keyboard. If the laptop is fully folded open it transforms in a 17 inch screen.



Q10. Where do you expect the speakers are placed in a foldable laptop? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q35. What would you expect from the speakers of the foldable laptop compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

volume and type of sound comparable to the laptop. But the location is different from my laptopt, because in the foldable laptop the screen is at the location of the speakers of my normal laptop.

Q77. What is the main advantage of a foldable laptop compared to a normal laptop in your eyes?

E	Bigger screen.	

Q36. Would the foldable laptop have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

Q73. What would you expect the audio quality to be of a foldable laptop?

	Excellent	Good	Average	Poor	Terrible
Audio quality		•		0	

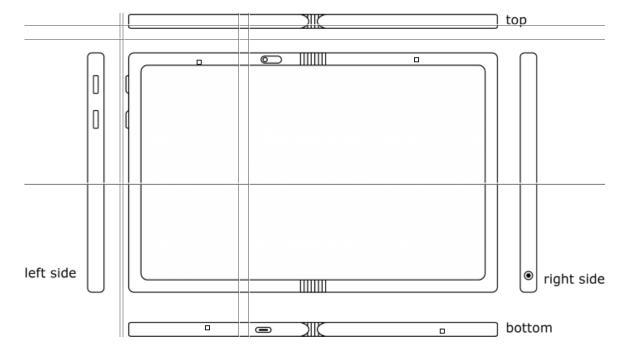
Q37. How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Laptop	1
Foldable laptop	2
Smartphone	3

tablet but the screen can be folded in half to reduce the size. When the tablet is fully folded open the screen is 13 inches, but the tablet can also be used in a small laptop position. Each half is turned into a 9 inch screen, which can be compared to a small tablet.



Q46. Where do you expect the speakers are placed in a foldable tablet? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q47. What would you expect from the speakers of the foldable tablet compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Good volume, but worse sound than the laptop.

Bigger screen and easier to	carry/take with you becaus		olded than an amoldab		
Q48. Would the foldable	e tablet have a mono	o or stereo spea	ker setup?		
○ Mono					
<ul><li>Stereo</li></ul>					
Mono, but the sound cha	anges with the orientation o	f the device			
Stereo, but the sound ch	nanges with the orientation	of the device			
?72. What would you e	expect the audio qual	ity to be of a fol	dable tablet?		
	Excellent	Good	Average	Poor	Terrible
dio quality	0		•	0	0
Laptop					1
Laptop Foldable tablet					2
Foldable tablet  Smartphone  951. Lastly we would liftformation anonymous	s so it cannot be liked				3
Foldable tablet  Smartphone  251. Lastly we would like formation anonymous  231. What would you see	s so it cannot be liked				3
Foldable tablet  Smartphone  251. Lastly we would like the state of th	s so it cannot be liked				3
Foldable tablet  Smartphone  251. Lastly we would like the street of the	s so it cannot be liked				3
Foldable tablet  Smartphone  251. Lastly we would like a second of the s	s so it cannot be liked				3
Foldable tablet  Smartphone  251. Lastly we would like a second of the s	s so it cannot be liked that is your gender?				3
Foldable tablet  Smartphone  251. Lastly we would libration anonymous  31. What would you so  Male Female Other I do not want to disclose	s so it cannot be liked that is your gender?				3
Foldable tablet  Smartphone  251. Lastly we would liftformation anonymous  31. What would you st  Male Female Other I do not want to disclose	s so it cannot be liked at the state is your gender?	to you as state			3
Foldable tablet  Smartphone  251. Lastly we would like formation anonymous  231. What would you so  Male Female Other I do not want to disclose	s so it cannot be liked at the state is your gender?	to you as state			3

Q78. What is the main advantage of a foldable tablet compared to a normal tablet in your eyes?

### Q34. How would you rate your hearing?

Excellent

Click to write Statement 1		•					
Q52. Check the boxes that	apply to you						
Before this survey I was alre	•		3				
I would consider myself up to	date on technology tr	ends					
I like to buy the newest person	onal mobile devices wh	en they are released					
Q100. Is there anything you would like to let us know either about the topic of the survey or the survey tself? If not you can submit the survey by clicking on next button.							

Good

Average

Poor

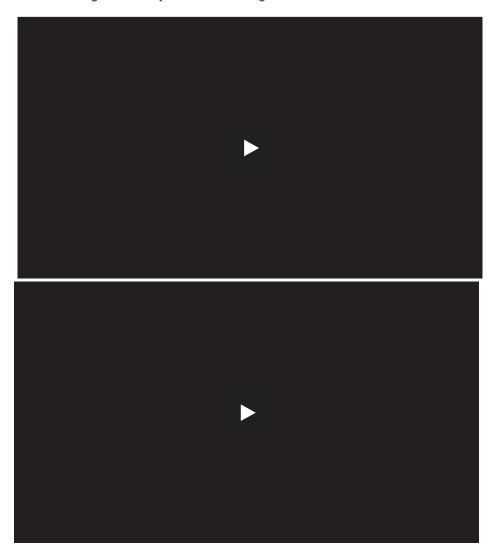
Terrible

Q109. For SurveyCircle users (www.surveycircle.com): The Survey Code is: G3LH-YBVM-Y719-SWNU or click the following link:  $\frac{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}$ 

# 8.10.3 User test results participant 3

Introduction. Thank you for participating in this research about expectations for speakers in personal mobile devices. With personal mobile devices we mean either laptops, smarphones or tablets. This research will take approximately 15 to 30 minutes, based on the amount of devices you participate with.

To participate in this survey we want you to have access to at least two (but preferably all) of the following mobile devices: a tablet, laptop, portable speaker and/or smartphone. These devices are needed to watch video's on YouTube on to rate the audio quailty of each seperate device. The video's you will use during this survey are the following:



These video's will also be available for the related questions, but only for the device you take the survey on. For your other devices we recommend you to use the titel of the video to find it on YouTube, scan the QR code or type the following links in your browser:

- https://www.youtube.com/watch?v=Vt4CEfMTLJc " Queen Bohemian Rhapsody (HQ) "
- https://www.youtube.com/watch?v=6TWJaFD6R2s " #Stereo: Left and Right Stereo Sound Test "

It is advised to test the video's on all devices before you continue with the survey and to make sure you are in an area in which you can play the audio at a audible level. The audio should be played through the speakers of the device itself, so not trough headphones or external speakers that are connected to the device.

All the information that is gathered in this survey will be kept confidential and your results are anonymous, non of these results can be linked back to you.

Devices used. State the devices you have access to to use during this research.

•	2 Laptop
	Portable speaker
	olet brand. Which brand and type of tablet do you own? (if you have multiple tablets only state the one will be using during this research)
Th	is question was not displayed to the respondent.
	5. How would you rank your tablet compared to other tablets on the market when you bought the let?
Th	is question was not displayed to the respondent.
Q74	4. In which year did you buy your tablet?
Th	is question was not displayed to the respondent.
	artphone brand. Which <u>brand</u> and <u>type</u> of smartphone do you own? (if you have multiple smartphones of state the one you will be using during this research)
Н	luawei P10
bou	6. How would you rank your smartphone compared to other smartphones on the market when you ught the smartphone?  High-end smartphone  Mid-range smartphone  Low-end smartphone
Q78	5. In which year did you buy your smartphone?
2	018
	otop brand. Which <u>brand</u> and <u>type</u> of laptop do you own? (if you have multiple laptops only <u>state the</u> <u>e you will be using</u> during this research)
Н	IP Z-book
	7. How would you rank your laptop compared to other laptops on the market when you bought the top?
	High-end laptop
	Mid-range laptop
	Low-end laptop
Q76	6. In which year did you buy your laptop?
2	019
_	

✓ Smartphone

Q102. Which <u>brand</u> and <u>type</u> of portable speaker do you own? (if you have portable speakers only <u>state</u> <u>the one you will be using</u> during this research)

This question was not displayed to the respondent.

Q103. How would you rank your portable speaker compared to other portable speakers on the market when you bought the portable speaker?

This question was not displayed to the respondent.

Q104. In which year did you buy your portable speaker?

This question was not displayed to the respondent.

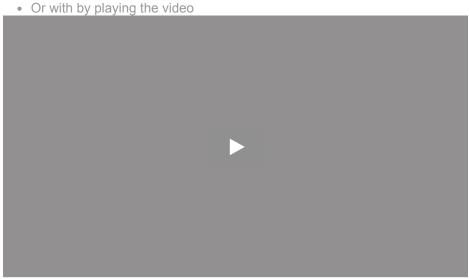
Speaker position. Indicate in which area the speakers of your tablet are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

This question was not displayed to the respondent.

Q9. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code





This question was not displayed to the respondent.

Q13. Did you take the speakers and sound quality into acount when buying your tablet?

This question was not displayed to the respondent.

Q38. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the tablet, external speakers connected to the tablet or headphones that are connected to the tablet via either bluethooth or cable.

Q61. What is the reason for your choice in setup when watching YouTube?

This question was not displayed to the respondent.

Q58. What is the reason for your choice in setup when browsing social media?

This question was not displayed to the respondent.

Q59. What is the reason for your choice in setup when listening to music?

This question was not displayed to the respondent.

Q60. What is the reason for your choice in setup when watching Netflix or online television?

This question was not displayed to the respondent.

Q14. After listening to the song on your tablet, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
- · By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q15. Describe <u>positive aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q16. Describe <u>negative aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Q17. If you could change anything about the sound performance of your tablet what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

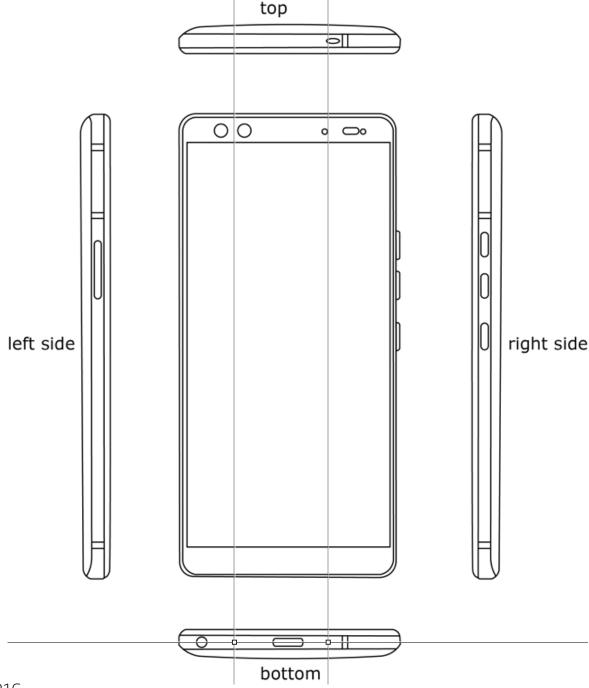
Q79. I would pay ... dollar/euro more for a tablet to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q80. I would be willing to choose a tablet that is ... milimeter (1 mm is 0.04 inch) thicker than my current tablet to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker tablet for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q25. Indicate in which area the speakers of your smartphone are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 2 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q26. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



Or with by playing the video



- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q27. Did you take the speakers and sound quality into acount when buying this smartphone?

- Yes
- Maybe / I can't remember
- No

Q62. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the smartphone, external speakers connected to the smartphoneor headphones that are connected to the smartphonevia either bluethooth or cable.

	I would play the audio via the speaker of my smartphone	I would play the audio from headphones connected to my smartphone	I would play the audio from external speakers connected to my smartphone
Watching YouTube	•	0	0
Browsing social media (Facebook, Instragram, etc)	•		
Listening to music			
Watching Netflix or online television		•	
(Video) calling		•	

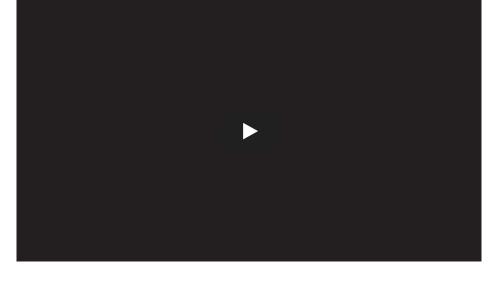
Q63. What is the reason for your choice in setup when watching YouTube?

- I don't want to bother other people
- I don't want other people to bother me

•	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q64.	What is the reason for your choice in setup when <b>browsing social media</b> ?
	I don't want to bother other people
	I don't want other people to bother me
$\bigcirc$	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q65.	What is the reason for your choice in setup when <u>listening to music</u> ?
	I don't want to bother other people
	I don't want other people to bother me
•	I can hear the audio better
0	The sound quality is better
0	Too much hassle to get another speaker or headphone
0	The sound quality is good as it is without the need for extra devices
	Other
Q66.	What is the reason for your choice in setup when watching Netflix or online television?
•	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
	After listening to the song on your smartphone, how do you rate the audio quality on a scale from
	o five? You can test this with: The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )
•	By typing the title in the search bar ( Queen - Bohemian Rhapsody (HQ) )
•	By scanning the QR code
	三
	<b>海海海流流</b>
	MARTO PRANCE

• Or with by playing the video

I can hear the audio betterThe sound quality is better



	Excellent	Good	Average	Poor	Terrible
Audio quality	0	0	•	0	0

Q29. Describe **positive** aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

ear	

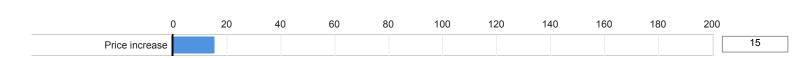
Q30. Describe <u>negative</u> aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Narrow

Q31. If you could change anything about the sound performance of your smartphone what would it be? If you would not change anything you can leave this field blank.

Having a left and right speaker	

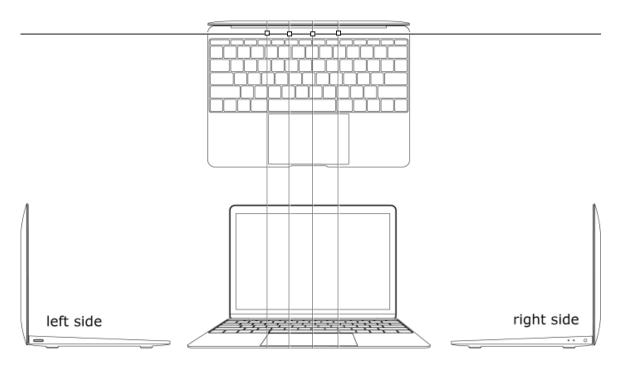
Q84. I would pay ... dollar/euro more for a smartphone to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q85. I would be willing to choose a smartphone that is ... milimeter (1 mm is 0.04 inch) thicker than my current smartphone to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker smartphone for a better sound performance set the slider to 0.

2

Q18. Indicate in which area the speakers of your laptop are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



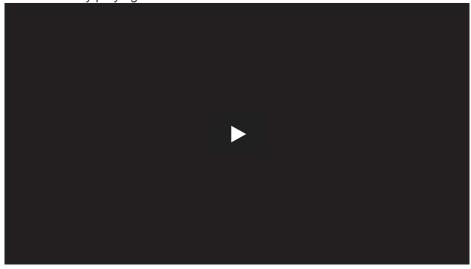
Q19. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code

Thickness increase



· Or with by playing the video



- Mono sound
- Stereo sound

Frowsing social media Facebook, Instragram, etc) istening to music	the options to chose betw	nario which case is most com reen internal speakers of the nected to the laptop via either	laptop, external speakers of	
Incoming social media Facebook, Instragram, etc) Sistening to music  Watching Nettlix or online elevision  Q68. What is the reason for your choice in setup when watching YouTube?  I don't want to bother other people I don't want other people to bother me I can hear the audio better Too much hassle to get another speaker or headphone Other  Q69. What is the reason for your choice in setup when browsing social media?  Q69. What is the reason for your choice in setup when browsing social media?  I don't want to bother other people I don't want to bother other people I don't want other people to bother me I can hear the audio better The sound quality is better			headphones connected to my	external speakers connected to
Secretopook, Instragram, etc) Istening to music Video) calling  Q68. What is the reason for your choice in setup when watching YouTube?  I don't want to bother other people I don't want other people to bother me I can hear the audio better The sound quality is better Too much hassle to get another speaker or headphone The sound quality is good as it is without the need for extra devices Other  Q69. What is the reason for your choice in setup when browsing social media?  I don't want to bother other people I don't want to bother other people I don't want to bother other people I don't want other people to bother me I can hear the audio better The sound quality is better The sound quality is better Too much hassle to get another speaker or headphone The sound quality is good as it is without the need for extra devices	Vatching YouTube	•	0	0
Istening to music Vatching Netflix or online Idevision  Q68. What is the reason for your choice in setup when watching YouTube?  I don't want to bother other people I don't want other people to bother me I can hear the audio better The sound quality is better Too much hassle to get another speaker or headphone The sound quality is good as it is without the need for extra devices Other  Q69. What is the reason for your choice in setup when browsing social media?  I don't want to bother other people I don't want to bother other people I don't want to bother other people The sound quality is better The sound quality is good as it is without the need for extra devices  The sound quality is better Too much hassle to get another speaker or headphone The sound quality is good as it is without the need for extra devices		•		
Action of the people of the pe			•	
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<ul> <li>The sound quality is good as it is without the need for extra devices</li> <li>Other</li> <li>Q69. What is the reason for your choice in setup when browsing social media?</li> <li>I don't want to bother other people</li> <li>I don't want other people to bother me</li> <li>I can hear the audio better</li> <li>The sound quality is better</li> <li>Too much hassle to get another speaker or headphone</li> <li>The sound quality is good as it is without the need for extra devices</li> </ul>	<ul> <li>The sound quality is better</li> </ul>			
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I don't want to bother other people I don't want other people to bother me I can hear the audio better The sound quality is better Too much hassle to get another speaker or headphone The sound quality is good as it is without the need for extra devices	Q69. What is the reason t	for your choice in setup when	browsing social media?	
I don't want other people to bother me I can hear the audio better The sound quality is better Too much hassle to get another speaker or headphone The sound quality is good as it is without the need for extra devices				
I can hear the audio better  The sound quality is better  Too much hassle to get another speaker or headphone  The sound quality is good as it is without the need for extra devices				
<ul> <li>The sound quality is better</li> <li>Too much hassle to get another speaker or headphone</li> <li>The sound quality is good as it is without the need for extra devices</li> </ul>		Dotner me		
Too much hassle to get another speaker or headphone  The sound quality is good as it is without the need for extra devices				
The sound quality is good as it is without the need for extra devices				
Other	_	as it is without the need for extra device	es	
	Other			
	Q70. What is the reason t	for your choice in setup when	listening to music?	
Q70. What is the reason for your choice in setup when <u>listening to music</u> ?	I don't want to bother other	people		
	I don't want other people to	bother me		
I don't want to bother other people	I can hear the audio better			
<ul> <li>I don't want to bother other people</li> <li>I don't want other people to bother me</li> </ul>				
<ul> <li>I don't want to bother other people</li> <li>I don't want other people to bother me</li> </ul>	<ul> <li>The sound quality is better</li> </ul>			
I don't want to bother other people I don't want other people to bother me I can hear the audio better	, ,			
I don't want to bother other people I don't want other people to bother me I can hear the audio better The sound quality is better	Too much hassle to get and	other speaker or headphone	es	

Q20. Did you take the speakers and sound quality into acount when buying this laptop?

I don't want other people to	bother me				
I can hear the audio better					
The sound quality is better					
Too much hassle to get ano	ther speaker or headphon	e			
The sound quality is good a	s it is without the need for	extra devices			
) Other					
1. After listening to the ? You can test this with The stereo test link ( By typing the title in to By scanning the QR	n: <u>https://www.youtub</u> he search bar ( <u>Que</u>	e.com/watch?	v=Vt4CEfMTLJc	)	from one to
Or with by playing the	e video	1-10.HF			
	Evenilent	Coord	Average	Poor	Torrible
quality	Excellent	Good	Average	Poor	Terrible
2. Describe <u>positive</u> as s field blank. As an examooth, Punchy, Wide, A	spects about the aumple you can use w	dio quality of yords such as:	our laptop. If the	re are not any y	you can leave
2. Describe <u>positive</u> as field blank. As an exar ooth, Punchy, Wide, Ag torted.	spects about the aumple you can use w	dio quality of yords such as:	our laptop. If the	re are not any y	you can leave
2. Describe <u>positive</u> as field blank. As an exar ooth, Punchy, Wide, Ag torted.	spects about the aumple you can use w	dio quality of yords such as:	our laptop. If the	re are not any y	you can leave
o quality 22. Describe <b>positive</b> as a field blank. As an exal nooth, Punchy, Wide, Ag storted.	spects about the aumple you can use w	dio quality of yords such as:	our laptop. If the	re are not any y	you can leave

Q71. What is the reason for your choice in setup when watching Netflix or online television?

222

Wide

WO	uld not change anything you can leave this field blank.	•		

Q24. If you could change anything about the sound performance of your laptop what would it be? If you

Q82. I would pay ... dollar/euro more for a laptop to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

0	20	40	60	80	100	120	140	160	180	200	
Price increase											0

Q83. I would be willing to choose a laptop that is ... milimeter (1 mm is 0.04 inch) thicker than my current laptop to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker laptop for a better sound performance set the slider to 0.

(	0 :	2 4	4 6	8	3 10	) 1:	2 1	4 1	6 1	8 20	)
Thickness increase											0

Q92. Check the boxes that apply for the purchase of your portable speaker

This question was not displayed to the respondent.

Q97. In which scenario's do you use your portable speaker?

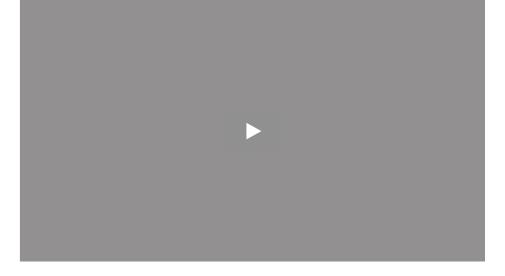
This question was not displayed to the respondent.

Q91. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



Or with by playing the video



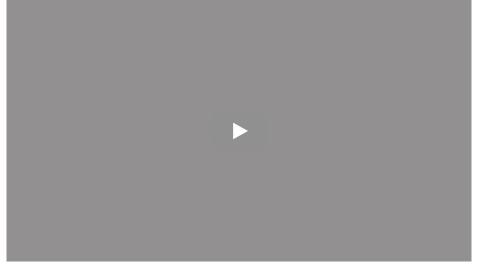
This question was not displayed to the respondent.

Q98. After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
- By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q99. Describe **positive** aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q100. Describe <u>negative</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Q101. If you could change anything about the sound performance of your portable speaker what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

Q102. I would pay ... dollar/euro more for a portable speaker to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q103. I would be willing to choose a portable speaker that is ... centimeter (1 cm is 0.4 inch) thicker than my current portable speaker to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker portable speaker for a better sound performance set the slider to 0.

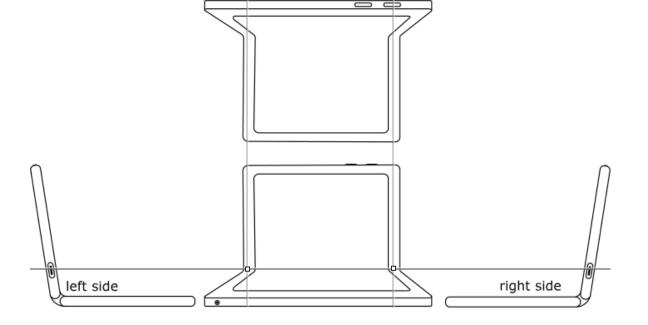
This question was not displayed to the respondent.

#### Q28.

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable laptop. This device has the same specifications as a well performing laptop but the screen covers the whole area of the laptop where the keyboard used to be. When the laptop is folded open in the laptop position the top of the screen can be compared to a regular tablet screen with another tablet screen as a keyboard. If the laptop is fully folded open it transforms in a 17 inch screen.



Q10. Where do you expect the speakers are placed in a foldable laptop? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q35. What would you expect from the speakers of the foldable laptop compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Acceptable sound quality, but can also be used with headphones for even better sound quality	

Q77. What is the main advantage of a foldable laptop compared to a normal laptop in your eyes?

Th	nat it's a combination with a tablet and small to carry around

Q36. Would the foldable laptop have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

Q73. What would you expect the audio quality to be of a foldable laptop?

	Excellent	Good	Average	Poor	Terrible
Audio quality	0	0	•	0	0

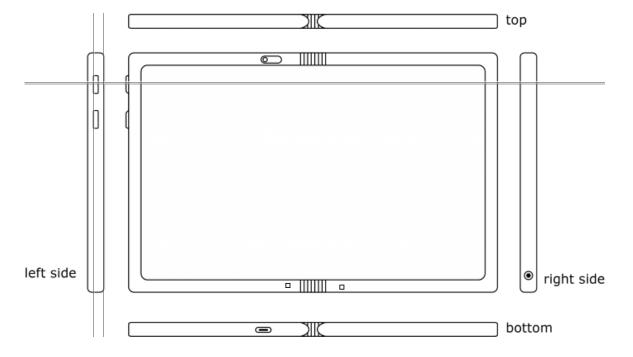
Q37. How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Foldable laptop	
Smartphone	
Laptop	

tablet but the screen can be folded in half to reduce the size. When the tablet is fully folded open the screen is 13 inches, but the tablet can also be used in a small laptop position. Each half is turned into a 9 inch screen, which can be compared to a small tablet.



Q46. Where do you expect the speakers are placed in a foldable tablet? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q47. What would you expect from the speakers of the foldable tablet compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Not high quality, not too high volume

18. Would the foldable to	ablet have a monc	or stereo spea	ker setup?		
<ul><li>Mono</li></ul>					
Stereo					
Mono, but the sound change	jes with the orientation o	f the device			
Stereo, but the sound chang	ges with the orientation	of the device			
72. What would you exp	ect the audio qual	ity to be of a fol	dable tablet?		
	Excellent	Good	Average	Poor	Terrible
o quality		$\circ$			
Laptop					1
Laptop					1
Foldable tablet					2
Smartphone					3
·					3
51. Lastly we would like ormation anonymous so					keep this
31. What would you stat	te is your gender?				
31. What would you state	te is your gender?				
-	e is your gender?				
○ Male	te is your gender?				
Male Female					
Male Female Other					
Male Female Other					
<ul><li>Male</li><li>Female</li><li>Other</li><li>I do not want to disclose this</li><li>32. How old are you?</li></ul>					
<ul><li>Male</li><li>Female</li><li>Other</li><li>I do not want to disclose this</li></ul>					
<ul><li>Male</li><li>Female</li><li>Other</li><li>I do not want to disclose this</li><li>32. How old are you?</li></ul>	is	y?			

Q78. What is the main advantage of a foldable tablet compared to a normal tablet in your eyes?

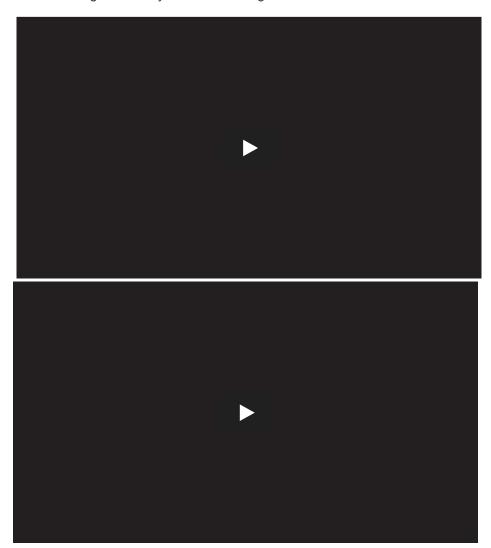
	Excellent	Good	Average	Poor	Terrible
Click to write Statement 1	0	0	•		
OF2 Chook the hoves that a	analy to you				
Q52. Check the boxes that a	ppiy to you				
■ Before this survey I was alread	y familiar with foldab	le tablets and laptop	s		
I would consider myself up to d	late on technology tre	ends			
☐ I like to buy the newest persona	al mobile devices wh	en they are released	i		
Q100. Is there anything you					

Q109. For SurveyCircle users (www.surveycircle.com): The Survey Code is: G3LH-YBVM-Y719-SWNU or click the following link:  $\frac{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}$ 

## 8.10.4 User test results participant 4

*Introduction.* Thank you for participating in this research about expectations for speakers in personal mobile devices. With personal mobile devices we mean either laptops, smarphones or tablets. This research will take approximately **15 to 30 minutes**, based on the amount of devices you participate with.

To participate in this survey we want you to have **access to at least two** (but preferably all) of the following mobile devices: a **tablet**, **laptop**, **portable speaker and/or smartphone**. These devices are needed to watch video's on YouTube on to rate the audio quailty of each seperate device. The video's you will use during this survey are the following:



These video's will also be available for the related questions, but only for the device you take the survey on. For your other devices we recommend you to use the titel of the video to find it on YouTube, scan the QR code or type the following links in your browser:

- https://www.youtube.com/watch?v=Vt4CEfMTLJc " Queen Bohemian Rhapsody (HQ) "
- https://www.youtube.com/watch?v=6TWJaFD6R2s " #Stereo: Left and Right Stereo Sound Test "

It is advised to test the video's on all devices before you continue with the survey and to make sure you are in an area in which you can play the audio at a audible level. The audio should be played through the speakers of the device itself, so not trough headphones or external speakers that are connected to the device.

All the information that is gathered in this survey will be kept confidential and your results are anonymous, non of these results can be linked back to you.

Devices used. State the devices you have access to to use during this research.

<b>✓</b>	Laptop
	Portable speaker
	let brand. Which brand and type of tablet do you own? (if you have multiple tablets only state the one will be using during this research)
Thi	is question was not displayed to the respondent.
Q55 <u>tabl</u>	5. How would you rank your tablet compared to other tablets on the market when you bought the let?
Thi	is question was not displayed to the respondent.
Q74	4. In which year did you buy your tablet?
Thi	is question was not displayed to the respondent.
	artphone brand. Which <u>brand</u> and <u>type</u> of smartphone do you own? (if you have multiple smartphones or <u>state the one you will be using</u> during this research)
S	amsung S9
•	High-end smartphone  Mid-range smartphone  Low-end smartphone
	) Low-end smartphone
Q75	5. In which year did you buy your smartphone?
20	019
M	top brand. Which <u>brand</u> and <u>type</u> of laptop do you own? (if you have multiple laptops only <u>state the</u> <u>you will be using</u> during this research)
	you will be using during this research)
	you will be using during this research)
	A you will be using during this research)  Tacbook Pro  To How would you rank your laptop compared to other laptops on the market when you bought the top?
lapt	Jacbook Pro  7. How would you rank your laptop compared to other laptops on the market when you bought the top?
lapt	According this research)  According this research)
lapt •	A you will be using during this research)  Itacbook Pro  7. How would you rank your laptop compared to other laptops on the market when you bought the top?  High-end laptop  Mid-range laptop
Q76	Accook Pro  7. How would you rank your laptop compared to other laptops on the market when you bought the top?  High-end laptop  Mid-range laptop  Low-end laptop

✓ Smartphone

Q102. Which <u>brand</u> and <u>type</u> of portable speaker do you own? (if you have portable speakers only <u>state</u> <u>the one you will be using</u> during this research)

This question was not displayed to the respondent.

Q103. How would you rank your portable speaker compared to other portable speakers on the market when you bought the portable speaker?

This question was not displayed to the respondent.

Q104. In which year did you buy your portable speaker?

This question was not displayed to the respondent.

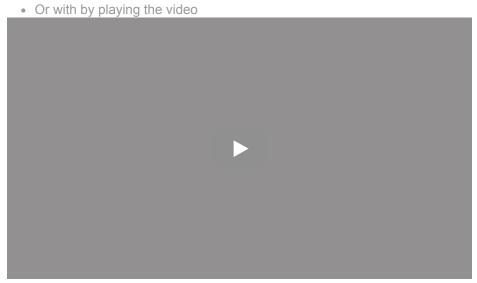
Speaker position. Indicate in which area the speakers of your tablet are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

This question was not displayed to the respondent.

Q9. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( <u>#Stereo: Left and Right Stereo Sound Test )</u>
- By scanning the QR code





This question was not displayed to the respondent.

Q13. Did you take the speakers and sound quality into acount when buying your tablet?

This question was not displayed to the respondent.

Q38. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the tablet, external speakers connected to the tablet or headphones that are connected to the tablet via either bluethooth or cable.

Q61. What is the reason for your choice in setup when watching YouTube?

This question was not displayed to the respondent.

Q58. What is the reason for your choice in setup when browsing social media?

This question was not displayed to the respondent.

Q59. What is the reason for your choice in setup when listening to music?

This question was not displayed to the respondent.

Q60. What is the reason for your choice in setup when watching Netflix or online television?

This question was not displayed to the respondent.

Q14. After listening to the song on your tablet, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
- · By scanning the QR code



Or with by playing the video



This question was not displayed to the respondent.

Q15. Describe <u>positive aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q16. Describe <u>negative aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Q17. If you could change anything about the sound performance of your tablet what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

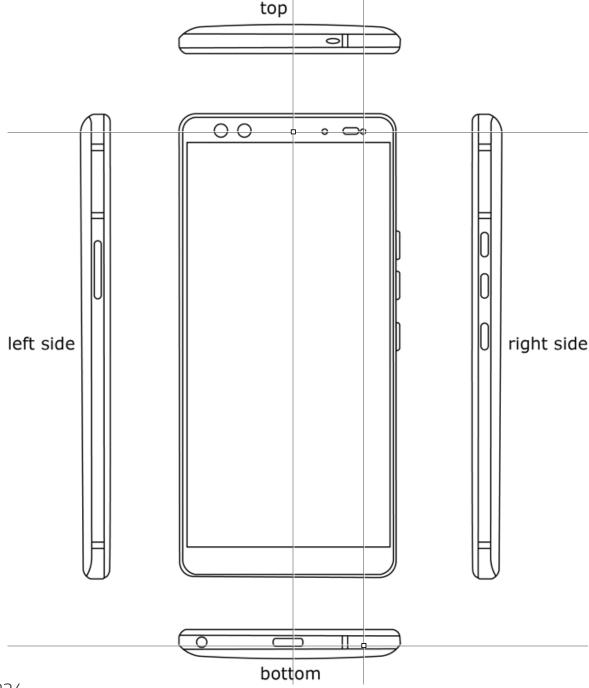
Q79. I would pay ... dollar/euro more for a tablet to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q80. I would be willing to choose a tablet that is ... milimeter (1 mm is 0.04 inch) thicker than my current tablet to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker tablet for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q25. Indicate in which area the speakers of your smartphone are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 2 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

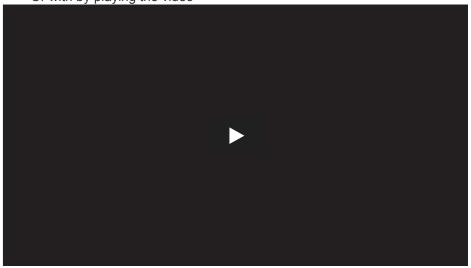


Q26. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



Or with by playing the video



- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q27. Did you take the speakers and sound quality into acount when buying this smartphone?

- Yes
- Maybe / I can't remember
- No

Q62. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the smartphone, external speakers connected to the smartphoneor headphones that are connected to the smartphonevia either bluethooth or cable.

	I would play the audio via the speaker of my smartphone	I would play the audio from headphones connected to my smartphone	I would play the audio from external speakers connected to my smartphone
Watching YouTube	0	•	0
Browsing social media (Facebook, Instragram, etc)	0	•	0
Listening to music	0	$\circ$	
Watching Netflix or online television			•
(Video) calling	•	$\circ$	

Q63. What is the reason for your choice in setup when watching YouTube?

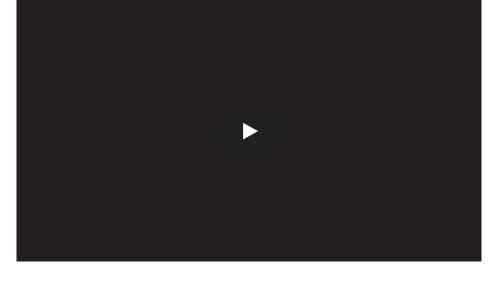
- I don't want to bother other people
- I don't want other people to bother me

$\bigcirc$	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q64.	What is the reason for your choice in setup when <u>browsing social media</u> ?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q65.	What is the reason for your choice in setup when <u>listening to music</u> ?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
•	The sound quality is good as it is without the need for extra devices
	Other
Q66.	What is the reason for your choice in setup when watching Netflix or online television?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
one t	After listening to the song on your smartphone, how do you rate the audio quality on a scale from to five? You can test this with:  The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )  By typing the title in the search bar ( <a href="Queen - Bohemian Rhapsody">Queen - Bohemian Rhapsody</a> (HQ)  By scanning the QR code
	(2) (1965) [2]



• Or with by playing the video

I can hear the audio better



	Excellent	Good	Average	Poor	Terrible
Audio quality	0	•	0	0	0

Q29. Describe **positive** aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Clear, Loud, Full, Bright, Smooth

Q30. Describe <u>negative</u> aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Narrow

Q31. If you could change anything about the sound performance of your smartphone what would it be? If you would not change anything you can leave this field blank.

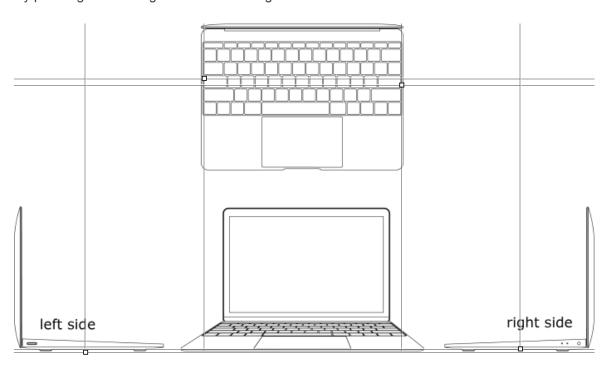
I would add more bass.		

Q84. I would pay ... dollar/euro more for a smartphone to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q85. I would be willing to choose a smartphone that is ... milimeter (1 mm is 0.04 inch) thicker than my current smartphone to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker smartphone for a better sound performance set the slider to 0.

Q18. Indicate in which area the speakers of your laptop are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

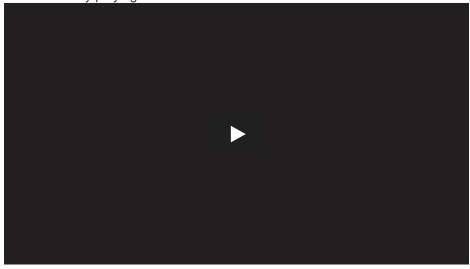


Q19. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



· Or with by playing the video



- Mono sound
- Stereo sound

Maybe / I can't remember			
O No			
	nario which case is most com ween internal speakers of the		
	nected to the laptop via eithe		connected to the laptop of
	I would play the audio via the speaker of my laptop	I would play the audio from headphones connected to my laptop	I would play the audio from external speakers connected to my laptop
Watching YouTube	0	•	0
Browsing social media Facebook, Instragram, etc)		•	
Listening to music		•	$\bigcirc$
Watching Netflix or online	•		0
television			
Video) calling		•	0
Q68. What is the reason	for your choice in setup when	watching YouTube?	
<ul><li>I don't want to bother other</li></ul>	r neonle		
I don't want other people to			
I can hear the audio better			
The sound quality is better			
	other speaker or headphone		
-	as it is without the need for extra devic	es	
Other			
Q69. What is the reason	for your choice in setup when	browsing social media?	
	y can chicae iii cotap iiiici	. <u></u>	
I don't want to bother other	people		
<ul> <li>I don't want other people to</li> </ul>	bother me		
I can hear the audio better			
<ul> <li>The sound quality is better</li> </ul>			
<ul> <li>Too much hassle to get an</li> </ul>	other speaker or headphone		
<ul> <li>The sound quality is good</li> </ul>	as it is without the need for extra devic	es	
Other			
Q70. What is the reason	for your choice in setup when	listening to music?	
.,	, 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		
I don't want to bother other	people		
I don't want other people to	bother me		
I can hear the audio better			
<ul> <li>The sound quality is better</li> </ul>			
<ul> <li>Too much hassle to get an</li> </ul>	other speaker or headphone		
<ul> <li>The sound quality is good</li> </ul>	as it is without the need for extra devic	es	
Other			

 $\gray 20$ . Did you take the speakers and sound quality into acount when buying this laptop?

Yes

	evices			
Too much hassle to get another speaker or headphone  The sound quality is good as it is without the need for extra de Other  21. After listening to the song on your laptop, how we? You can test this with:  The stereo test link ( <a href="https://www.youtube.com">https://www.youtube.com</a> By typing the title in the search bar ( <a href="Queen - F">Queen - F</a> By scanning the QR code  Or with by playing the video  Or with by playing the video  Excellent  Go quality  22. Describe positive aspects about the audio quis field blank. As an example you can use words smooth, Punchy, Wide, Aggressive, Bright, Synthet istorted.	evices			
The sound quality is good as it is without the need for extra do Other  21. After listening to the song on your laptop, howe? You can test this with: The stereo test link ( https://www.youtube.com By typing the title in the search bar ( Queen - I By scanning the QR code  Or with by playing the video  Excellent  Go io quality  Excellent  Go is field blank. As an example you can use words a mooth, Punchy, Wide, Aggressive, Bright, Synthet storted.	evices			
Other  21. After listening to the song on your laptop, how e? You can test this with:  • The stereo test link ( https://www.youtube.com • By typing the title in the search bar ( Queen - Beta	evices			
21. After listening to the song on your laptop, how e? You can test this with:  • The stereo test link ( https://www.youtube.com • By typing the title in the search bar ( Queen - I • By scanning the QR code  • Or with by playing the video  • Or with by playing the video  Excellent Go io quality  • Excellent Go is field blank. As an example you can use words smooth, Punchy, Wide, Aggressive, Bright, Synthet storted.				
e? You can test this with:  The stereo test link ( https://www.youtube.com  By typing the title in the search bar ( Queen - I e by scanning the QR code  Or with by playing the video  Excellent Gradient				
Excellent Go io quality  22. Describe positive aspects about the audio qu is field blank. As an example you can use words s mooth, Punchy, Wide, Aggressive, Bright, Synthet storted.	n/watch?v=Vt4Cl	EfMTLJc )	on a scale fi	rom one to
Excellent Godio quality  ©  222. Describe positive aspects about the audio qualis field blank. As an example you can use words smooth, Punchy, Wide, Aggressive, Bright, Synthet istorted.				
22. Describe <b>positive</b> aspects about the audio quis field blank. As an example you can use words smooth, Punchy, Wide, Aggressive, Bright, Synthet storted.				
22. Describe <u>positive</u> aspects about the audio qu is field blank. As an example you can use words s mooth, Punchy, Wide, Aggressive, Bright, Synthet istorted.	ood Ave	erage	Poor	Terrible
22. Describe <b>positive</b> aspects about the audio quis field blank. As an example you can use words smooth, Punchy, Wide, Aggressive, Bright, Synthet istorted.	_		0	0
Clean, Full, Strong, Clear, Deep, Bright, Loud, Smooth	such as: Clean, I	Full, Strong, C	lear, Spacio	ous, Deep,
Clean, Full, Strong, Clear, Deep, Bright, Loug, Smooth				
, ,				
23. Describe <u>negative</u> aspects about the audio qu				

Q71. What is the reason for your choice in setup when watching Netflix or online television?

O I don't want to bother other people

Distorted.

would not change anything you can leave this field blank.		

Q24. If you could change anything about the sound performance of your laptop what would it be? If you

Q82. I would pay ... dollar/euro more for a laptop to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

0	20	40	60	80	100	120	140	160	180	200	
Price increase											0

Q83. I would be willing to choose a laptop that is ... milimeter (1 mm is 0.04 inch) thicker than my current laptop to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker laptop for a better sound performance set the slider to 0.

	0 2	2 4	4 6	8	10	) 12	2 14	1 1	0 1	8 20	U
Thickness increase											0

Q92. Check the boxes that apply for the purchase of your portable speaker

This question was not displayed to the respondent.

Q97. In which scenario's do you use your portable speaker?

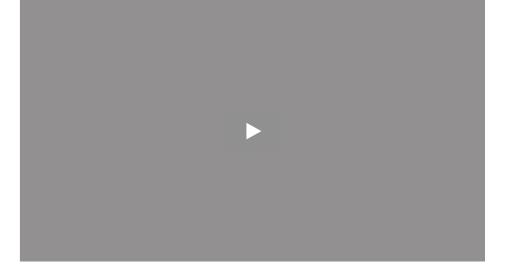
This question was not displayed to the respondent.

Q91. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



Or with by playing the video



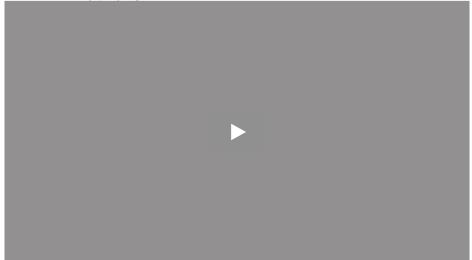
This question was not displayed to the respondent.

Q98. After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
- By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q99. Describe **positive** aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q100. Describe <u>negative</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q101. If you could change anything about the sound performance of your portable speaker what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

Q102. I would pay ... dollar/euro more for a portable speaker to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q103. I would be willing to choose a portable speaker that is ... centimeter (1 cm is 0.4 inch) thicker than my current portable speaker to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker portable speaker for a better sound performance set the slider to 0.

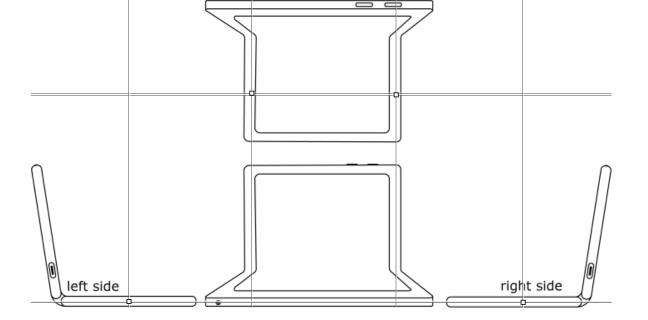
This question was not displayed to the respondent.

#### Q28.

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable laptop. This device has the same specifications as a well performing laptop but the screen covers the whole area of the laptop where the keyboard used to be. When the laptop is folded open in the laptop position the top of the screen can be compared to a regular tablet screen with another tablet screen as a keyboard. If the laptop is fully folded open it transforms in a 17 inch screen.



Q10. Where do you expect the speakers are placed in a foldable laptop? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q35. What would you expect from the speakers of the foldable laptop compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Nice bass, proper volume and clear stereo sound.

Q77. What is the main advantage of a foldable laptop compared to a normal laptop in your eyes?

The tablet functionality.			

Q36. Would the foldable laptop have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

Q73. What would you expect the audio quality to be of a foldable laptop?

	Excellent	Good	Average	Poor	Terrible
Audio quality	0	•			

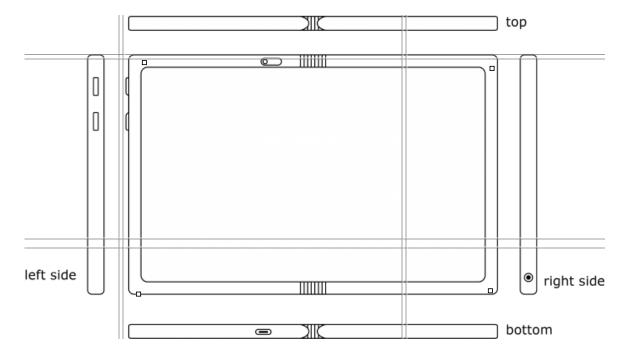
Q37. How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Laptop	1
Foldable laptop	2
Smartphone	3

tablet but the screen can be folded in half to reduce the size. When the tablet is fully folded open the screen is 13 inches, but the tablet can also be used in a small laptop position. Each half is turned into a 9 inch screen, which can be compared to a small tablet.



Q46. Where do you expect the speakers are placed in a foldable tablet? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q47. What would you expect from the speakers of the foldable tablet compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Proper volume and bass, clear multi-stereo sound

Mono Mono, but the sound changes with the orientation of the device Stereo, but the sound changes with the orientation of the device Stereo, but the sound changes with the orientation of the device T22. What would you expect the audio quality to be of a foldable tablet?    Excellent   Good   Average   Poor   Terrible	The tablet functionality					
Stereo  Mono, but the sound changes with the orientation of the device  Stereo, but the sound changes with the orientation of the device  TZZ. What would you expect the audio quality to be of a foldable tablet?  Excellent Good Average Poor Terrible dio quality  Excellent Good Average Poor Terrible dio quality  DYDB. How would you rank the foldable tablet compared to your devices, based on your expectations bout the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst peakers.  Laptop  Foldable tablet  Smarrphone  3.  1251. Lastly we would like to get some background information about who you are. We will keep this formation anonymous so it cannot be liked to you as stated in the introduction.  131. What would you state is your gender?  Male Female Other  I do not want to disclose this  132. How old are you?	48. Would the foldable tal	blet have a mono	or stereo spea	ker setup?		
Mono, but the sound changes with the orientation of the device  Stereo, but the sound changes with the orientation of the device  T72. What would you expect the audio quality to be of a foldable tablet?  Excellent Good Average Poor Terrible did quality  T08. How would you rank the foldable tablet compared to your devices, based on your expectations bout the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst peakers.  Laptop  Laptop  Foldable tablet  Smartphone  3.  1.1. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.  231. What would you state is your gender?  Male  Female  Other  I do not want to disclose this  322. How old are you?						
Stereo, but the sound changes with the orientation of the device    172. What would you expect the audio quality to be of a foldable tablet?   173. What would you rank the foldable tablet compared to your devices, based on your expectations bout the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst peakers.    Laptop	○ Stereo					
Excellent   Good   Average   Poor   Terrible	Mono, but the sound change	s with the orientation of	the device			
Excellent Good Average Poor Terrible  dio quality  ### 108. How would you rank the foldable tablet compared to your devices, based on your expectations bout the foldable tablet? I being the best in terms of speakers and ascending to the device with the worst peakers.  Laptop  Foldable tablet  Smartphone  ### 13. Lastly we would like to get some background information about who you are. We will keep this formation anonymous so it cannot be liked to you as stated in the introduction.  ### 13. What would you state is your gender?  ### Male  Female  Other  I do not want to disclose this  ### 133. What would you state is your nationality?	Stereo, but the sound change	es with the orientation o	of the device			
2708. How would you rank the foldable tablet compared to your devices, based on your expectations bout the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst peakers.  Laptop  Foldable tablet  2 Smartphone  3.  251. Lastly we would like to get some background information about who you are. We will keep this formation anonymous so it cannot be liked to you as stated in the introduction.  231. What would you state is your gender?  Male  Female  Other  I do not want to disclose this	72. What would you expe	ct the audio quali	ty to be of a fol	dable tablet?		
2708. How would you rank the foldable tablet compared to your devices, based on your expectations bout the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst peakers.  Laptop  Foldable tablet  2  Smartphone  3  251. Lastly we would like to get some background information about who you are. We will keep this formation anonymous so it cannot be liked to you as stated in the introduction.  231. What would you state is your gender?  Male  Female  Other  I do not want to disclose this  232. How old are you?		Excellent	Good	Average	Poor	Terrible
bout the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst peakers.  Laptop  Foldable tablet  Smartphone  3  251. Lastly we would like to get some background information about who you are. We will keep this formation anonymous so it cannot be liked to you as stated in the introduction.  31. What would you state is your gender?  Male  Female  Other  I do not want to disclose this  32. How old are you?	dio quality	$\circ$		$\circ$	$\bigcirc$	
Smartphone  251. Lastly we would like to get some background information about who you are. We will keep this formation anonymous so it cannot be liked to you as stated in the introduction.  231. What would you state is your gender?  Male Female Other I do not want to disclose this  232. How old are you?						2
251. Lastly we would like to get some background information about who you are. We will keep this formation anonymous so it cannot be liked to you as stated in the introduction.  231. What would you state is your gender?  Male  Female  Other  I do not want to disclose this  232. How old are you?	Foldable tablet					2
formation anonymous so it cannot be liked to you as stated in the introduction.  31. What would you state is your gender?  Male Female Other I do not want to disclose this  32. How old are you?  23.  What would you state is your nationality?	Smartphone					3
<ul> <li>Male</li> <li>Female</li> <li>Other</li> <li>I do not want to disclose this</li> </ul> 23. How old are you? 23 23. What would you state is your nationality?	formation anonymous so	it cannot be liked				eep this
Other I do not want to disclose this  23. How old are you?  23. What would you state is your nationality?	31. What would you state	is your gender?				
Other I do not want to disclose this  23. How old are you?  23.  23. What would you state is your nationality?	<ul><li>Male</li></ul>					
I do not want to disclose this  232. How old are you?  23  233. What would you state is your nationality?	Female					
23. How old are you?  23. What would you state is your nationality?						
23 233. What would you state is your nationality?	I do not want to disclose this					
233. What would you state is your nationality?	32. How old are you?					
	23					
Dutch	33. What would you state	is your nationalit	y?			
	Dutch					

Q78. What is the main advantage of a foldable tablet compared to a normal tablet in your eyes?

### Q34. How would you rate your hearing?

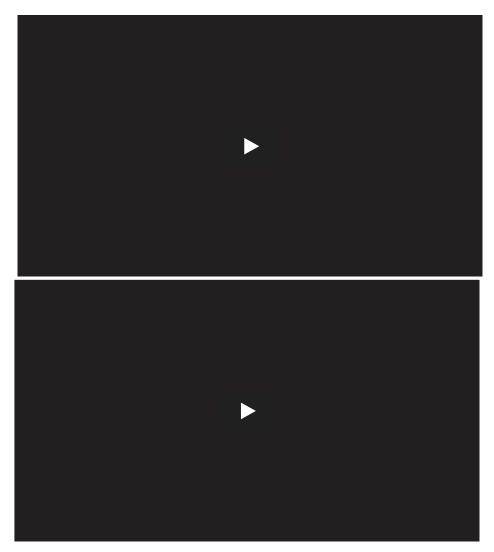
	Excellent	Good	Average	Poor	Terrible
Click to write Statement 1	•	0	0	0	0
Q52. Check the boxes that	apply to you				
QUZ. Officer the boxes that	арріу іо уоц				
✓ Before this survey I was alre	adv familiar with foldab	le tablets and laptor	os		
	•				
I would consider myself up to	date on technology tre	ends			
I like to buy the newest person	onal mobile devices wh	en they are release	d		
Q100. Is there anything yo	u would like to let	us know eithe	r about the topic o	of the survey or	the survey
itself? If not you can submi				in the curvey of	ano our voy
,	, ,	J			
Good luck with the rest of the re-	searchl				
Good lack with the rest of the res	ocaron:				

Q109. For SurveyCircle users (www.surveycircle.com): The Survey Code is: G3LH-YBVM-Y719-SWNU or click the following link:  $\frac{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}$ 

# 8.10.5 User test results participant 5

*Introduction.* Thank you for participating in this research about expectations for speakers in personal mobile devices. With personal mobile devices we mean either laptops, smarphones or tablets. This research will take approximately **15 to 30 minutes**, based on the amount of devices you participate with.

To participate in this survey we want you to have **access to at least two** (but preferably all) of the following mobile devices: a **tablet**, **laptop**, **portable speaker and/or smartphone**. These devices are needed to watch video's on YouTube on to rate the audio quailty of each seperate device. The video's you will use during this survey are the following:



These video's will also be available for the related questions, but only for the device you take the survey on. For your other devices we recommend you to use the titel of the video to find it on YouTube, scan the QR code or type the following links in your browser:

- https://www.youtube.com/watch?v=Vt4CEfMTLJc " Queen Bohemian Rhapsody (HQ) "
- https://www.youtube.com/watch?v=6TWJaFD6R2s " #Stereo: Left and Right Stereo Sound Test "

It is advised to test the video's on all devices before you continue with the survey and to make sure you are in an area in which you can play the audio at a audible level. The audio should be played through the speakers of the device itself, so not trough headphones or external speakers that are connected to the device.

All the information that is gathered in this survey will be kept confidential and your results are anonymous, non of these results can be linked back to you.

Devices used. State the devices you have access to to use during this research.

ASUS ZenPad  Q55. How would you rank your tablet compared to other tablets on the mablet?  High-end tablet  Mid-range tablet  Low-end tablet	narket when you bought the
<ul><li>Ablet?</li><li>High-end tablet</li><li>Mid-range tablet</li></ul>	narket when you bought the
<ul><li>Ablet?</li><li>High-end tablet</li><li>Mid-range tablet</li></ul>	narket when you bought the
Mid-range tablet	
Low-end tablet	
?74. In which year did you buy your tablet?	
2018	
<i>martphone brand.</i> Which <u>brand</u> and <u>type</u> of smartphone do you own? (inly <u>state the one you will be using</u> during this research)	if you have multiple smartphon
Samsung Galaxy S7	
256. How would you rank your smartphone compared to other smartphorought the smartphone?	nes <b>on the market when you</b>
High-end smartphone	
Mid-range smartphone	
Low-end smartphone	
75. In which year did you buy your smartphone?	
2016	
aptop brand. Which <u>brand</u> and <u>type</u> of laptop do you own? (if you have ne you will be using during this research)	multiple laptops only state the
<b></b>	
Lenovo Thinkpad	
57. How would you rank your laptop compared to other laptops <u>on the r</u>	

SmartphoneLaptop

✓ Portable speaker

Low-end laptop

Q76. In which year did you buy your laptop?

119	

Q102. Which <u>brand</u> and <u>type</u> of portable speaker do you own? (if you have portable speakers only <u>state</u> <u>the one you will be using</u> during this research)

ONIV ODO VEE
ONY SRS-X55

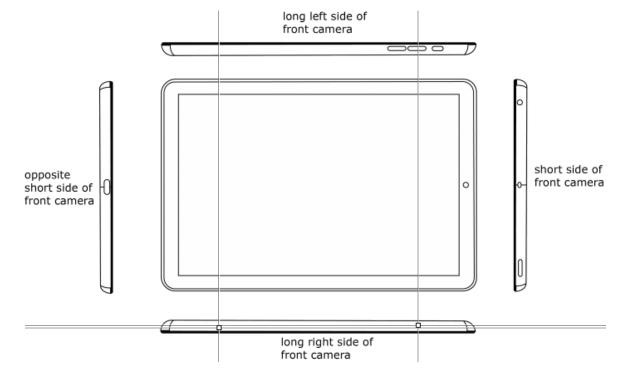
Q103. How would you rank your portable speaker compared to other portable speakers on the market when you bought the portable speaker?

- High-end portable speaker
- Mid-range portable speaker
- Low-end portable speaker

Q104. In which year did you buy your portable speaker?

17
$\sim 11$

Speaker position. Indicate in which area the speakers of your tablet are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

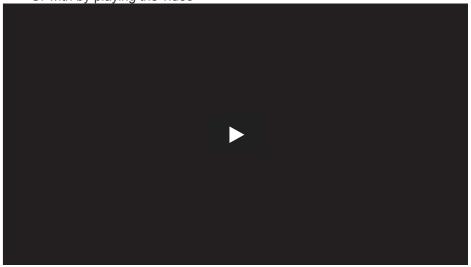


Q9. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



• Or with by playing the video



- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q13. Did you take the speakers and sound quality into acount when buying your tablet?

- Yes
- Maybe / I can't remember
- No

Q38. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the tablet, external speakers connected to the tablet or headphones that are connected to the tablet via either bluethooth or cable.

	I would play the audio via the speaker of my tablet	I would play the audio from headphones connected to my tablet	I would play the audio from external speakers connected to my tablet
Watching YouTube	•	0	0
Browsing social media (Facebook, Instragram, etc)	•		
Listening to music		•	
Watching Netflix or online television		•	
(Video) calling	•		

Q61. What is the reason for your choice in setup when watching YouTube?

- I don't want to bother other people
- O I don't want other people to bother me
- I can hear the audio better
- The sound quality is better
- Too much hassle to get another speaker or headphone
- The sound quality is good as it is without the need for extra devices

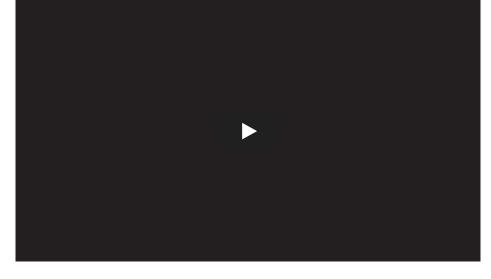
Q58.	What is the reason for your choice in setup when <u>browsing social media</u> ?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
•	The sound quality is good as it is without the need for extra devices
	Other
Q59.	What is the reason for your choice in setup when <u>listening to music</u> ?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
•	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
$\bigcirc$	Other
Q60.	What is the reason for your choice in setup when watching Netflix or online television?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
$\bigcirc$	Other
014	After listening to the song on your tablet, how do you rate the audio quality on a scale from one to
	You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )
  By typing the title in the search bar ( <a href="Queen Bohemian Rhapsody">Queen Bohemian Rhapsody</a> (HQ) )
  By scanning the QR code

Other



• Or with by playing the video



	Excellent	Good	Average	Poor	Terrible
Audio quality					

Q15. Describe <u>positive aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

pright	_

Q16. Describe <u>negative aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Ī	thin

Q17. If you could change anything about the sound performance of your tablet what would it be? If you would not change anything you can leave this field blank.

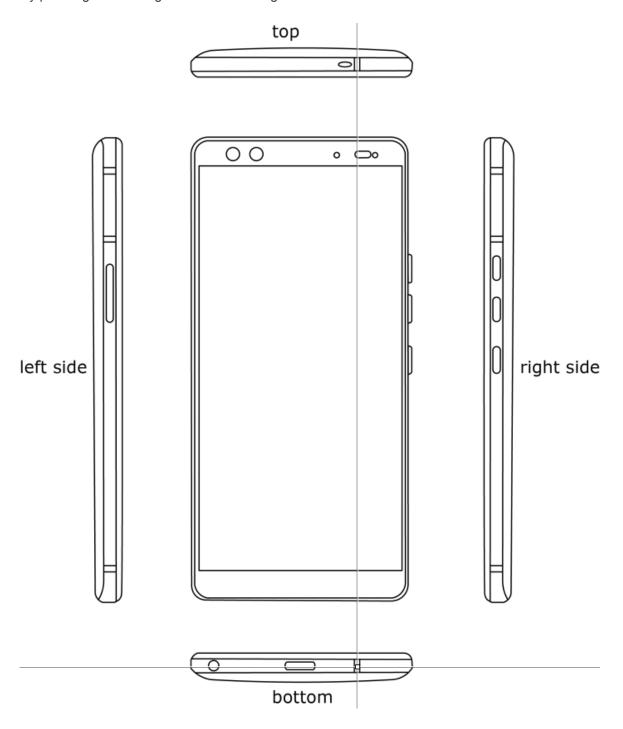


Q79. I would pay ... dollar/euro more for a tablet to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q80. I would be willing to choose a tablet that is ... milimeter (1 mm is 0.04 inch) thicker than my current tablet to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker tablet for a better sound performance set the slider to 0.

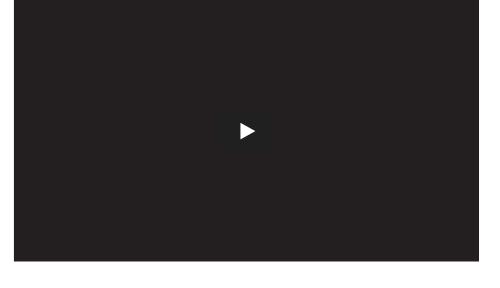
Q25. Indicate in which area the speakers of your smartphone are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 2 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q26. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code





_				
	Moi		001	ınd
	IVIO	IIO	SUL	иu

Q27. Did you take the speakers and sound quality into acount when buying this smartphone?

Yes

Maybe / I can't remember

No

Q62. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the smartphone, external speakers connected to the smartphoneor headphones that are connected to the smartphonevia either bluethooth or cable.

	I would play the audio via the speaker of my smartphone	I would play the audio from headphones connected to my smartphone	I would play the audio from external speakers connected to my smartphone
Watching YouTube	•	0	0
Browsing social media (Facebook, Instragram, etc)	•		0
Listening to music		•	
Watching Netflix or online television		•	0
(Video) calling	•		

Q63. What is the reason for your choice in setup when watching YouTube?

1	don't	want	to	bother	other	naonla
	uont	want	ιυ	DOULE	Othici	heobic

- I don't want other people to bother me
- I can hear the audio better
- The sound quality is better
- Too much hassle to get another speaker or headphone
- The sound quality is good as it is without the need for extra devices

Other Other

Q64. What is the reason for your choice in setup when browsing social media?

I don't want to bother other people

255

Stereo sound

The sound changes with the orientation of the device

	I can hear the audio better
$\bigcirc$	The sound quality is better
	Too much hassle to get another speaker or headphone
•	The sound quality is good as it is without the need for extra devices
0	Other
Q65	What is the reason for your choice in setup when <u>listening to music</u> ?
	I don't want to bother other people
$\bigcirc$	I don't want other people to bother me
	I can hear the audio better
•	The sound quality is better
$\bigcirc$	Too much hassle to get another speaker or headphone
$\bigcirc$	The sound quality is good as it is without the need for extra devices
$\bigcirc$	Other
Q66	. What is the reason for your choice in setup when watching Netflix or online television?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
•	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
one •	After listening to the song on your smartphone, how do you rate the audio quality on a scale from to five? You can test this with:  The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )  By typing the title in the search bar ( <a href="Queen - Bohemian Rhapsody">Queen - Bohemian Rhapsody</a> (HQ)  By scanning the QR code

 $\hfill \bigcirc$  I don't want other people to bother me



	Excellent	Good	Averag	je Po	oor	Terrible			
Audio quality	0	0	0	(					
Q29. Describe <b>positive</b> as leave this field blank. As a Deep, Smooth, Punchy, W Harsh, Distorted.	n example you c	an use words s	uch as: Clea	an, Full, Strong	g, Clear, Spa	acious,			
clear									
Q30. Describe negative as leave this field blank. As a Deep, Smooth, Punchy, W Harsh, Distorted.	n example you o	an use words s	uch as: Clea	an, Full, Strong	g, Clear, Spa	acious,			
synhetic									
Q31. If you could change a you would not change any				our smartphon	e what would	d it be? If		1	
Q84. I would pay dollar/ right amount. If you would							djust the	slider to	the
	0 20	40 60	80	100 120	140	160	180	200	
Price increase									0
Q85. I would be willing to omake the previously stated smartphone for a better so	d changes possil	ble. Adjust the s	lider to the						
	0 2	4 6	8	10 12	14	16	18	20	
Thickness increase									0
Q18. Indicate in which are indicate where the speake each dot counts as one sp	r is placed by cli	cking on that are	ea. You can	place a total of	of 4 speaker	locations		A	

it by pressing and holding down while moving the dot.

257

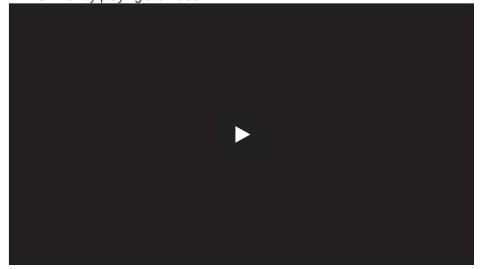


Q19. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( <u>#Stereo: Left and Right Stereo Sound Test</u> )
- · By scanning the QR code



• Or with by playing the video



- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q20. Did you take the speakers and sound quality into acount when buying this laptop?

- Yes
- Maybe / I can't remember
- No

Q67. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the laptop, external speakers connected to the laptop or headphones that are connected to the laptop via either bluethooth or cable.

	I would play the audio via the speaker of my laptop	I would play the audio from headphones connected to my laptop	I would play the audio from external speakers connected to my laptop
Watching YouTube	•	0	0
Browsing social media (Facebook, Instragram, etc)	•		
Listening to music		•	
Watching Netflix or online television		•	
(Video) calling	0		•

Watching YouTube	•				
Browsing social media (Facebook, Instragram, etc)	•	0	$\circ$		
Listening to music		•			
Watching Netflix or online television	0	•			
(Video) calling			•		
	r your choice in setup when	watching YouTube?			
I don't want to bother other p	•				
I don't want other people to b	oother me				
I can hear the audio better					
The sound quality is better					
Too much hassle to get anoth	•				
	it is without the need for extra device	es			
Other					
I don't want to bother other p I don't want other people to b I can hear the audio better The sound quality is better Too much hassle to get another	The sound quality is better  Too much hassle to get another speaker or headphone				
Other	Other				
I don't want to bother other p I don't want other people to b I can hear the audio better The sound quality is better Too much hassle to get anoth	oother me				
Q71 What is the reason to	r vour choice in setup when	watching Netflix or onlin	e television?		

$\bigcirc$	I don't want to bother other people
	I doubt work other populate bother

- I don't want other people to bother me
- I can hear the audio better
- The sound quality is better

<ul> <li>The sound quality is good as</li> </ul>	it is without the need for	or extra devices			
Other					
21. After listening to the size? You can test this with:  The stereo test link ( the size is by typing the title in the size is by scanning the QR of	: <u>nttps://www.youtu</u> ne search bar ( <u>Q</u>	ibe.com/watch?	v=Vt4CEfMTLJc	)	from one to
Or with by playing the	video			_	
	<b>&gt;</b>				
lio quality	Excellent	Good	Average	Poor	Terrible
22. Describe <u>positive</u> as is field blank. As an exam mooth, Punchy, Wide, Ag istorted.	nple you can use	words such as:	Clean, Full, Stro	ng, Clear, Spac	ious, Deep,
23. Describe <u>negative</u> as is field blank. As an exam mooth, Punchy, Wide, Ag istorted.	ple you can use	words such as:	Clean, Full, Stro	ng, Clear, Spac	ious, Deep,
narrow					
224. If you could change a ould not change anything			nance of your lapt	top what would	it be? If you

 $\hfill \bigcirc$  Too much hassle to get another speaker or headphone

260

Q82. I would pay ... dollar/euro more for a laptop to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

0	2	0 4	0 60	80	) 10	00 12	20 14	10 16	50 18	30 20	0
Price increase											0

Q83. I would be willing to choose a laptop that is ... milimeter (1 mm is 0.04 inch) thicker than my current laptop to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker laptop for a better sound performance set the slider to 0.

C	) 2	2 4	6	8	1	0 1:	2 1	4 1	6 1	8 20	J
Thickness increase											0

Q92. Check the boxes that apply for the purchase of your portable speaker

1	Sound	quality
•	Souriu	quanty

- Size
- Price
- Design
- Build in light feature
- Bluethooth
- Connect multiple speakers toghether
- Charge phone with portable speaker
- Other
- None of the above

Q97. In which scenario's do you use your portable speaker?

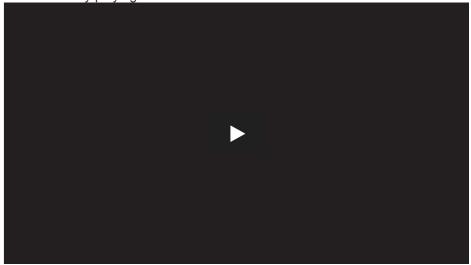
- Play music at a party
- Play music in a park/garden
- Play music in everyday use
- Play audio of movie or televison
- Use during (video) calls
- Sound during presentations or meetings
- As sound improvement during laptop use
- As sound improvement during tablet use
- As sound improvement during smartphone use
- Other
- None of the above

Q91. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



• Or with by playing the video



- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q98. After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

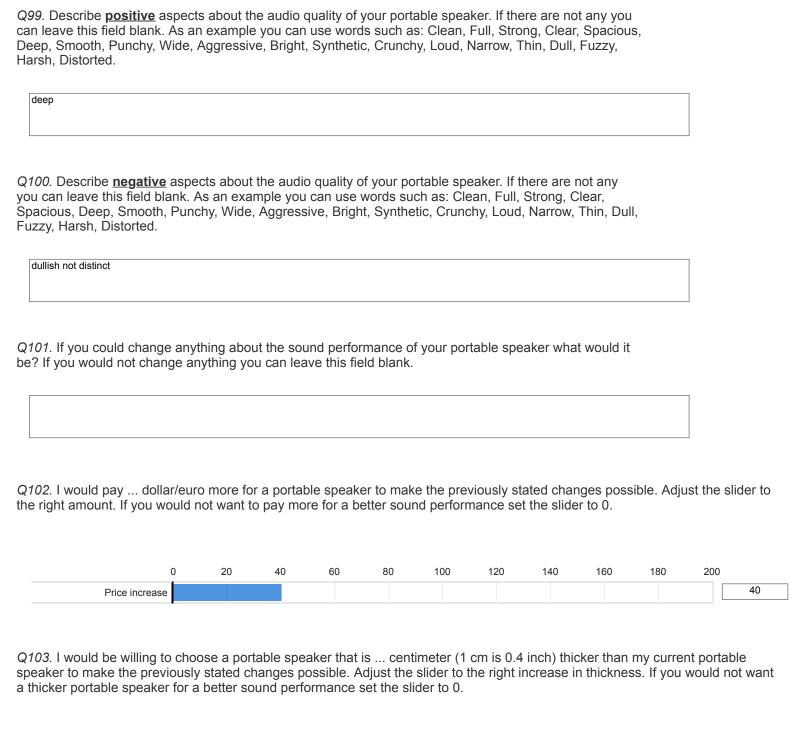
- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
  By typing the title in the search bar ( <a href="Queen Bohemian Rhapsody">Queen Bohemian Rhapsody</a> (HQ)
  By scanning the QR code



• Or with by playing the video



	Excellent	Good	Average	Poor	Terrible
Audio quality			•		



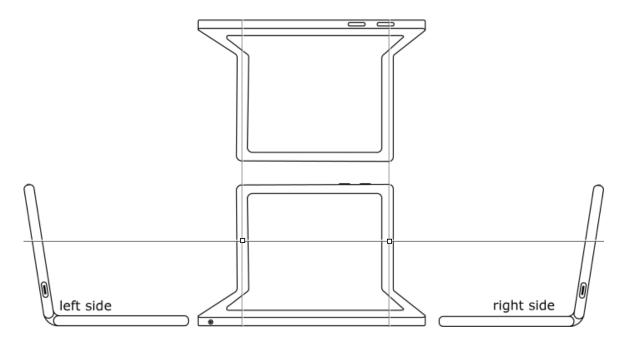
Q28.

Thickness increase

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable laptop. This device has the same specifications as a well performing laptop but the screen covers the whole area of the laptop where the keyboard used to be. When the laptop is folded open in the laptop position the top of the screen can be compared to a regular tablet screen with another tablet screen as a keyboard. If the laptop is fully folded open it transforms in a 17 inch screen.



Q10. Where do you expect the speakers are placed in a foldable laptop? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q35. What would you expect from the speakers of the foldable laptop compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

direct and controlled from the device itself without reflections from i.e. table

Q77. What is the main advantage of a foldable laptop compared to a normal laptop in your eyes?

possibility for multiply open views		
possibility for maniply open viewe		!

Q36. Would the foldable laptop have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

	Excellent	Good	Average	Poor	Terrible
Audio quality	0	•			

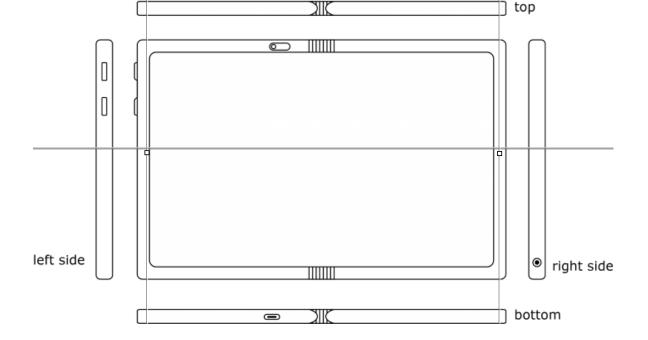
Q37. How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Portable speaker	1
Foldable laptop	2
Laptop	3
Tablet	4
Smartphone	5

Q45. In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable tablet. This device has the same specifications as a well performing tablet but the screen can be folded in half to reduce the size. When the tablet is fully folded open the screen is 13 inches, but the tablet can also be used in a small laptop position. Each half is turned into a 9 inch screen, which can be compared to a small tablet.



Q46. Where do you expect the speakers are placed in a foldable tablet? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q47. What would you expect from the speakers of the foldable tablet compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

stereo clear sound			

Q78. What is the main advantage of a foldable tablet compared to a normal tablet in your eyes?

larger display in same package

Q48. Would the foldable tablet have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

## Q72. What would you expect the audio quality to be of a foldable tablet?

	Excellent	Good	Average	Poor	Terrible
Audio quality			•		

Q108. How would you rank the foldable tablet compared to your devices, based on your expectations about the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Portable speaker	1
Laptop	2
Foldable tablet	3
Tablet	4
Smartphone	5

Q31. What would you state					
Male     Famela					
Other					
I do not want to disclose this					
Q32. How old are you?					
65					
00					
233. What would you state	e is your nationalit	ty?			
Finnish					
Q34. How would you rate y	our hearing?				
34. How would you rate y	ı	Good	Average	Poor	Terrible
	our hearing?  Excellent	Good	Average	Poor	Terrible
	Excellent				
ck to write Statement 1	Excellent				
ck to write Statement 1	Excellent				
ck to write Statement 1	Excellent   apply to you	0	0		
ck to write Statement 1	Excellent  apply to you  ady familiar with foldab	ole tablets and laptop	0		
ick to write Statement 1  Q52. Check the boxes that  Before this survey I was alre	Excellent  apply to you  ady familiar with foldaboodate on technology tree	ole tablets and laptop	is s		
ick to write Statement 1  Q52. Check the boxes that  Before this survey I was alre  I would consider myself up to	Excellent  apply to you  ady familiar with foldaboodate on technology tree	ole tablets and laptop	is s		
ck to write Statement 1  Q52. Check the boxes that  Before this survey I was alre  I would consider myself up to	Excellent  apply to you  ady familiar with foldabe be date on technology tre  onal mobile devices wh	ole tablets and laptop ends nen they are released	s s		
ick to write Statement 1  Q52. Check the boxes that  Before this survey I was alre I would consider myself up to I like to buy the newest pers	Excellent  apply to you  ady familiar with foldabe be date on technology tre  onal mobile devices when	ole tablets and laptopends nen they are released	s about the topic o		
ick to write Statement 1  Q52. Check the boxes that  Before this survey I was alre  I would consider myself up to  I like to buy the newest pers  Q100. Is there anything you self? If not you can subm	Excellent  apply to you  ady familiar with foldabe be date on technology tre  onal mobile devices when	ole tablets and laptopends nen they are released	s about the topic o		
ick to write Statement 1  Q52. Check the boxes that  Before this survey I was alre  I would consider myself up to I like to buy the newest pers	Excellent  apply to you  ady familiar with foldabe be date on technology tre  onal mobile devices when	ole tablets and laptopends nen they are released	s about the topic o		
ick to write Statement 1  Q52. Check the boxes that  Before this survey I was alre  I would consider myself up to I like to buy the newest pers  Q100. Is there anything yotself? If not you can subm	Excellent  apply to you  ady familiar with foldabe be date on technology tre  onal mobile devices when	ole tablets and laptopends nen they are released	s about the topic o		
■ I would consider myself up t ■ I like to buy the newest pers  Q100. Is there anything yo tself? If not you can subm	Excellent  apply to you  ady familiar with foldabe be date on technology tre  onal mobile devices when	ole tablets and laptopends nen they are released	s about the topic o		

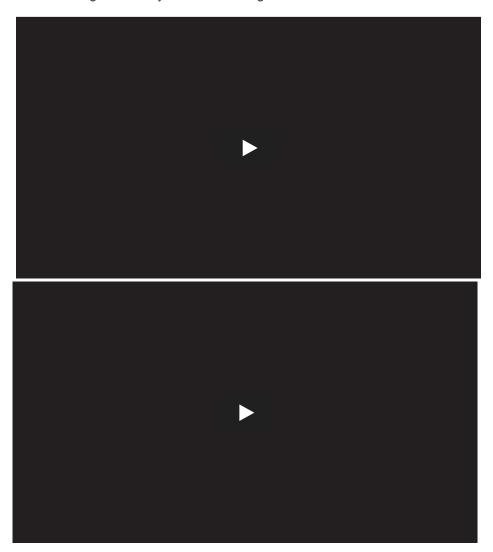
Q51. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.

Q109. For SurveyCircle users (www.surveycircle.com): The Survey Code is: G3LH-YBVM-Y719-SWNU or click the following link: <a href="https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU">https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU</a>

## 8.10.6 User test results participant 6

*Introduction.* Thank you for participating in this research about expectations for speakers in personal mobile devices. With personal mobile devices we mean either laptops, smarphones or tablets. This research will take approximately **15 to 30 minutes**, based on the amount of devices you participate with.

To participate in this survey we want you to have **access to at least two** (but preferably all) of the following mobile devices: a **tablet**, **laptop**, **portable speaker and/or smartphone**. These devices are needed to watch video's on YouTube on to rate the audio quailty of each seperate device. The video's you will use during this survey are the following:



These video's will also be available for the related questions, but only for the device you take the survey on. For your other devices we recommend you to use the titel of the video to find it on YouTube, scan the QR code or type the following links in your browser:

- https://www.youtube.com/watch?v=Vt4CEfMTLJc " Queen Bohemian Rhapsody (HQ) "
- https://www.youtube.com/watch?v=6TWJaFD6R2s " #Stereo: Left and Right Stereo Sound Test "

It is advised to test the video's on all devices before you continue with the survey and to make sure you are in an area in which you can play the audio at a audible level. The audio should be played through the speakers of the device itself, so not trough headphones or external speakers that are connected to the device.

All the information that is gathered in this survey will be kept confidential and your results are anonymous, non of these results can be linked back to you.

Devices used. State the devices you have access to to use during this research.

✓ Laptop
Portable speaker
Tablet brand. Which brand and type of tablet do you own? (if you have multiple tablets only state the on you will be using during this research)
This question was not displayed to the respondent.
Q55. How would you rank your tablet compared to other tablets on the market when you bought the tablet?
This question was not displayed to the respondent.
Q74. In which year did you buy your tablet?
This question was not displayed to the respondent.
Smartphone brand. Which <u>brand</u> and <u>type</u> of smartphone do you own? (if you have multiple smartphone only <u>state the one you will be using</u> during this research)
iPhone 6s
<ul> <li>High-end smartphone</li> <li>Mid-range smartphone</li> <li>Low-end smartphone</li> </ul>
Q75. In which year did you buy your smartphone?
2015
Laptop brand. Which <u>brand</u> and <u>type</u> of laptop do you own? (if you have multiple laptops only <u>state the</u> one <u>you will be using</u> during this research)
MacBook Pro 2013
Q57. How would you rank your laptop compared to other laptops on the market when you bought the laptop?
High-end laptop
Low-end laptop
Q76. In which year did you buy your laptop?
2013

✓ Smartphone

Q102. Which **brand** and **type** of portable speaker do you own? (if you have portable speakers only **state the one you will be using** during this research)

This question was not displayed to the respondent.

Q103. How would you rank your portable speaker compared to other portable speakers on the market when you bought the portable speaker?

This question was not displayed to the respondent.

Q104. In which year did you buy your portable speaker?

This question was not displayed to the respondent.

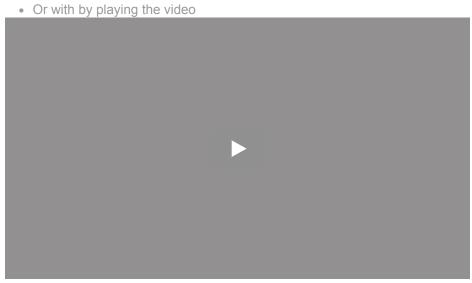
Speaker position. Indicate in which area the speakers of your tablet are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

This question was not displayed to the respondent.

Q9. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar (#Stereo: Left and Right Stereo Sound Test)
- By scanning the QR code





This question was not displayed to the respondent.

Q13. Did you take the speakers and sound quality into acount when buying your tablet?

This question was not displayed to the respondent.

Q38. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the tablet, external speakers connected to the tablet or headphones that are connected to the tablet via either bluethooth or cable.

Q61. What is the reason for your choice in setup when watching YouTube?

This question was not displayed to the respondent.

Q58. What is the reason for your choice in setup when browsing social media?

This question was not displayed to the respondent.

Q59. What is the reason for your choice in setup when listening to music?

This question was not displayed to the respondent.

Q60. What is the reason for your choice in setup when watching Netflix or online television?

This question was not displayed to the respondent.

Q14. After listening to the song on your tablet, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
- · By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q15. Describe <u>positive aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

*Q16.* Describe <u>negative aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Q17. If you could change anything about the sound performance of your tablet what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

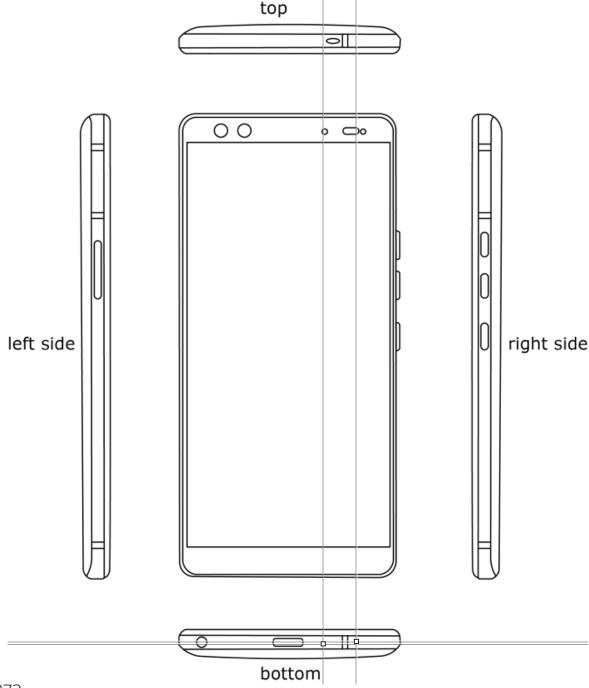
Q79. I would pay ... dollar/euro more for a tablet to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q80. I would be willing to choose a tablet that is ... milimeter (1 mm is 0.04 inch) thicker than my current tablet to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker tablet for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q25. Indicate in which area the speakers of your smartphone are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 2 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q26. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



Or with by playing the video



- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q27. Did you take the speakers and sound quality into acount when buying this smartphone?

- Yes
- Maybe / I can't remember
- No

Q62. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the smartphone, external speakers connected to the smartphoneor headphones that are connected to the smartphonevia either bluethooth or cable.

	I would play the audio via the speaker of my smartphone	I would play the audio from headphones connected to my smartphone	I would play the audio from external speakers connected to my smartphone
Watching YouTube	•	0	0
Browsing social media (Facebook, Instragram, etc)	•		
Listening to music			
Watching Netflix or online television		•	
(Video) calling		•	

Q63. What is the reason for your choice in setup when watching YouTube?

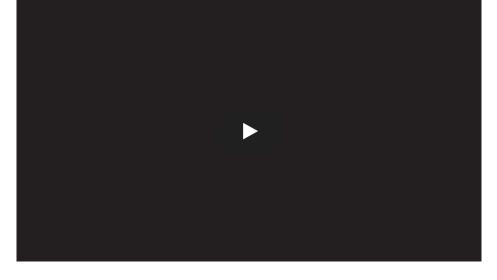
- I don't want to bother other people
- I don't want other people to bother me

	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q64.	What is the reason for your choice in setup when <b>browsing social media</b> ?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
$\bigcirc$	Other
Q65.	What is the reason for your choice in setup when <u>listening to music</u> ?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q66.	What is the reason for your choice in setup when watching Netflix or online television?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better  The count quality is better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
000	After lietening to the congress your property have been do you not a the could asset the could be asset.
	After listening to the song on your smartphone, how do you rate the audio quality on a scale from o five? You can test this with:
•	The stereo test link ( https://www.youtube.com/watch?v=Vt4CEfMTLJc )
	By typing the title in the search bar ( <u>Queen - Bohemian Rhapsody (HQ)</u> ) By scanning the QR code
-	



• Or with by playing the video

I can hear the audio betterThe sound quality is better



	Excellent	Good	Average	Poor	Terrible
Audio quality	0	0	0	•	0

Q29. Describe **positive** aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

clear (but better than expected in this very quiet surrounding)
clear (but better than expected in this very quiet surrounding)

Q30. Describe <u>negative</u> aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

narrow, no base

Q31. If you could change anything about the sound performance of your smartphone what would it be? If you would not change anything you can leave this field blank.

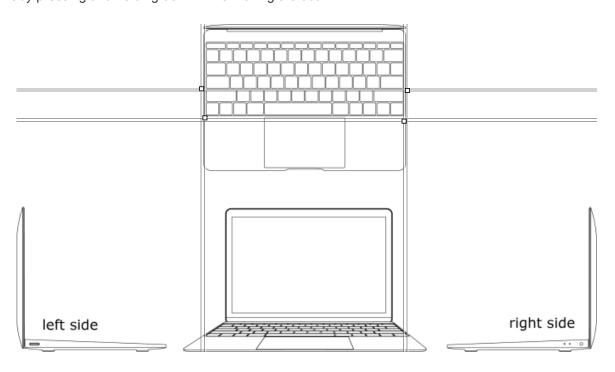
```
deeper, stronger, more base...possibility to make louder...really make it as good as a 50€ bluetooth speaker
```

Q84. I would pay ... dollar/euro more for a smartphone to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q85. I would be willing to choose a smartphone that is ... milimeter (1 mm is 0.04 inch) thicker than my current smartphone to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker smartphone for a better sound performance set the slider to 0.

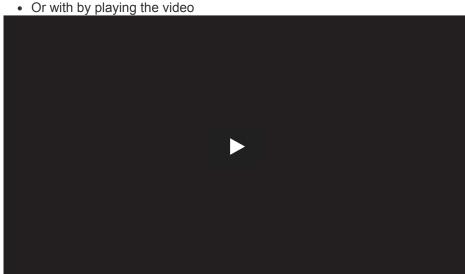
Q18. Indicate in which area the speakers of your laptop are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q19. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( <u>#Stereo: Left and Right Stereo Sound Test )</u>
- · By scanning the QR code





- Mono sound
- Stereo sound

<ul><li>No</li></ul>			
	nario which case is most com		
	een internal speakers of the nected to the laptop via either		connected to the laptop or
nodaphonoo that are com	Toolog to the laptop via olthol	biddiriodiri or odbio.	
		I would play the audio from	I would play the audio from
	I would play the audio via the speaker of my laptop	headphones connected to my laptop	external speakers connected to my laptop
Vatching YouTube	•	0	0
Browsing social media Facebook, Instragram, etc)	•		$\circ$
istening to music		(0)	$\circ$
Vatching Netflix or online	0	•	$\circ$
elevision		-	
Video) calling		•	0
Q68. What is the reason f	or your choice in setup when	watching YouTube?	
I don't want to bother other			
I don't want other people to	potner me		
I can hear the audio better			
The sound quality is better			
-	other speaker or headphone		
The sound quality is good a	as it is without the need for extra device	es	
Other			
Q69. What is the reason f	or your choice in setup when	browsing social media?	
I don't want to bother other			
I don't want other people to	bother me		
I can hear the audio better			
<ul> <li>The sound quality is better</li> </ul>			
Too much hassle to get and			
	other speaker or headphone as it is without the need for extra device	es	
		es	

Q20. Did you take the speakers and sound quality into acount when buying this laptop?

Yes

re? You can test this with:  The stereo test link ( https://www.youtube.com/watch?v=Vt4CEfMTLJc )  By typing the title in the search bar ( Queen - Bohemian Rhapsody.(HQ).)  By scanning the QR code  Or with by playing the video  Excellent Good Average Poor Terrible  lio quality  Excellent Good Average Poor Terrible  122. Describe positive aspects about the audio quality of your laptop. If there are not any you can leave is field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, mooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh,	<ul> <li>I don't want other people t</li> </ul>					
The sound quality is better  To much hassle to get another speaker or headphone  The sound quality is good as it is without the need for extra devices  Other  21. After listening to the song on your laptop, how do you rate the audio quality on a scale from one to e? You can test this with:  The stere test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )  By typing the title in the search bar ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">Queen - Bohemian Rhapsody.(HQ)</a> )  By scanning the QR code  Or with by playing the video  Or with by playing the video  Or with by playing the video  Excellent  Good  Average  Poor  Terrible  io quality  22. Describe positive aspects about the audio quality of your laptop. If there are not any you can leave is field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, mooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, storted.		o bother me				
To much hassle to get another speaker or headphone  The sound quality is good as it is without the need for extra devices  Other  27. After listening to the song on your laptop, how do you rate the audio quality on a scale from one to e? You can test this with:  • The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTL.lc">https://www.youtube.com/watch?v=Vt4CEfMTL.lc</a> )  • By typing the title in the search bar ( <a href="Queen-Bohemian Rhapsody">Queen-Bohemian Rhapsody</a> (HQ)  • By scanning the QR code  • Or with by playing the video  • Or with b	I can hear the audio better	r				
The sound quality is good as it is without the need for extra devices  Other  21. After listening to the song on your laptop, how do you rate the audio quality on a scale from one to e? You can test this with:  The stereo test link ( https://www.youtube.com/watch?v=Vt4CEfMTLJc)  By typing the title in the search bar ( Queen - Bohemian Rhapsody (HQ).)  By scanning the QR code  Or with by playing the video  Excellent Good Average Poor Terrible  lio quality  Excellent Good Average Poor Terrible  10 quality  22. Describe positive aspects about the audio quality of your laptop. If there are not any you can leave is field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, mooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, storted.	The sound quality is bette	r				
27. After listening to the song on your laptop, how do you rate the audio quality on a scale from one to e? You can test this with:  The stereo test link ( <a href="https://www.youtube.com/watch?v=Vl4CEftMTLJc">https://www.youtube.com/watch?v=Vl4CEftMTLJc</a> )  By typing the title in the search bar ( <a href="Queen-Bohemian Rhapsody">Queen-Bohemian Rhapsody</a> (HQ).)  By scanning the QR code  Or with by playing the video  Excellent  Good  Average  Poor  Terrible  io quality  Quality  Poor  Terrible  is field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, mooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, storted.	Too much hassle to get ar	nother speaker or headpho	one			
21. After listening to the song on your laptop, how do you rate the audio quality on a scale from one to ve? You can test this with:  • The stereo test link (https://www.youtube.com/watch?v=Vt4CEfMTLJc) • By typing the title in the search bar (Queen - Bohemian Rhapsody.(HQ).) • By scanning the QR code  • Or with by playing the video  • Or with by playing the video    Excellent   Good   Average   Poor   Terrible	The sound quality is good	as it is without the need f	for extra devices			
By scanning the QR code  Or with by playing the video  Excellent Good Average Poor Terrible lid quality  In Quality  22. Describe positive aspects about the audio quality of your laptop. If there are not any you can leave is field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, mooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, istorted.	Other					
e? You can test this with:  The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )  By typing the title in the search bar ( <a href="Queen - Bohemian Rhapsody">Queen - Bohemian Rhapsody</a> (HQ).)  By scanning the QR code  Or with by playing the video  Excellent  Good  Average  Poor  Terrible  lo quality  Poor  Terrible  22. Describe positive aspects about the audio quality of your laptop. If there are not any you can leave is field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, mooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, storted.						
Excellent Good Average Poor Terrible dio quality    Excellent Good Average Poor Terrible  Describe positive aspects about the audio quality of your laptop. If there are not any you can leave is field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, mooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, istorted.	<ul><li>/e? You can test this wi</li><li>The stereo test link</li><li>By typing the title in</li></ul>	th: ( <u>https://www.youtu</u> the search bar ( <u>Q</u>	ibe.com/watch?	v=Vt4CEfMTLJc	)	from one to
22. Describe <b>positive</b> aspects about the audio quality of your laptop. If there are not any you can leave is field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, mooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, storted.	Or with by playing the state of the sta	he video			_	
222. Describe <b>positive</b> aspects about the audio quality of your laptop. If there are not any you can leave his field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, mooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, historted.		<b>&gt;</b>				
22. Describe <u>positive</u> aspects about the audio quality of your laptop. If there are not any you can leave is field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, mooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, istorted.						
is field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, mooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, storted.		Excellent	Good	Average	Poor	Terrible
clear, strong, bright	dio quality					
	222. Describe <u>positive</u> a nis field blank. As an exa mooth, Punchy, Wide, A	aspects about the a	uudio quality of y words such as:	our laptop. If the	re are not any yng, Clear, Spac	ou can leave ious, Deep,
	22. Describe positive a is field blank. As an examooth, Punchy, Wide, A istorted.	aspects about the a	uudio quality of y words such as:	our laptop. If the	re are not any yng, Clear, Spac	ou can leave ious, Deep,
	222. Describe positive and its field blank. As an examooth, Punchy, Wide, Anistorted.	aspects about the a	uudio quality of y words such as:	our laptop. If the	re are not any yng, Clear, Spac	ou can leave ious, Deep,
	22. Describe positive a lis field blank. As an examooth, Punchy, Wide, A istorted.	aspects about the a	uudio quality of y words such as:	our laptop. If the	re are not any yng, Clear, Spac	ou can leave ious, Deep,
	22. Describe positive a is field blank. As an examooth, Punchy, Wide, A istorted.  clear, strong, bright	aspects about the a ample you can use Aggressive, Bright,	● nudio quality of y words such as: Synthetic, Crun	our laptop. If the Clean, Full, Stro chy, Loud, Narro	re are not any yng, Clear, Spac w, Thin, Dull, Fu	ou can leave ious, Deep, izzy, Harsh,
23. Describe negative aspects about the audio quality of your laptop. If there are not any you can leave is field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep,	22. Describe positive a is field blank. As an examooth, Punchy, Wide, A istorted.  clear, strong, bright  23. Describe negative	aspects about the a ample you can use Aggressive, Bright, a	● nudio quality of y words such as: Synthetic, Crun	your laptop. If the Clean, Full, Strown chy, Loud, Narrow	re are not any yng, Clear, Spac w, Thin, Dull, Fu	you can leave ious, Deep, uzzy, Harsh,

Q71. What is the reason for your choice in setup when watching Netflix or online television?

278

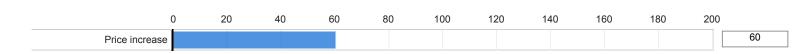
Distorted.

narrow

Q24. If you could change anything about the sound performance of your laptop what would it be? If you would not change anything you can leave this field blank.

more full, more base, deeper		

Q82. I would pay ... dollar/euro more for a laptop to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q83. I would be willing to choose a laptop that is ... milimeter (1 mm is 0.04 inch) thicker than my current laptop to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker laptop for a better sound performance set the slider to 0.



Q92. Check the boxes that apply for the purchase of your portable speaker

This question was not displayed to the respondent.

Q97. In which scenario's do you use your portable speaker?

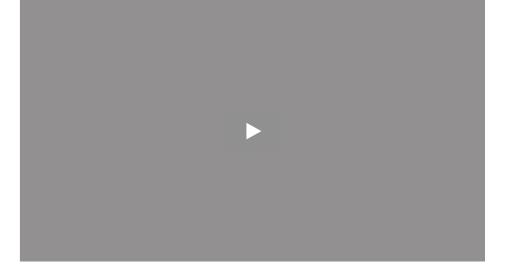
This question was not displayed to the respondent.

Q91. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



Or with by playing the video



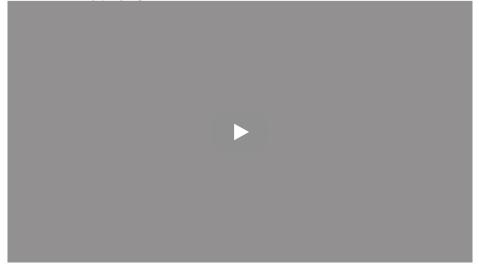
This question was not displayed to the respondent.

Q98. After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
- By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q99. Describe **positive** aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q100. Describe <u>negative</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Q101. If you could change anything about the sound performance of your portable speaker what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

Q102. I would pay ... dollar/euro more for a portable speaker to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q103. I would be willing to choose a portable speaker that is ... centimeter (1 cm is 0.4 inch) thicker than my current portable speaker to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker portable speaker for a better sound performance set the slider to 0.

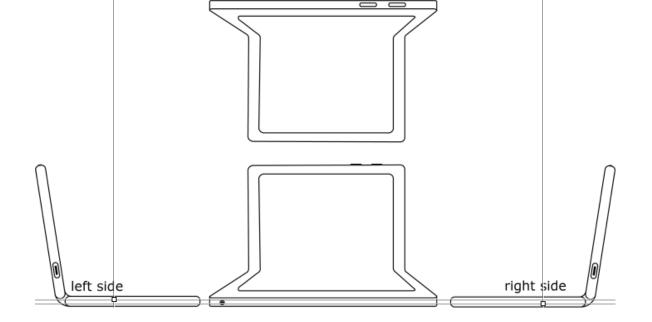
This question was not displayed to the respondent.

## Q28.

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable laptop. This device has the same specifications as a well performing laptop but the screen covers the whole area of the laptop where the keyboard used to be. When the laptop is folded open in the laptop position the top of the screen can be compared to a regular tablet screen with another tablet screen as a keyboard. If the laptop is fully folded open it transforms in a 17 inch screen.



Q10. Where do you expect the speakers are placed in a foldable laptop? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q35. What would you expect from the speakers of the foldable laptop compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Same as laptop, or even a bit less	· · · · · · · · · · · · · · · · · · ·
	l l
	· · · · · · · · · · · · · · · · · · ·

Q77. What is the main advantage of a foldable laptop compared to a normal laptop in your eyes?

bigger screen, better presentation possibilities to people around you

Q36. Would the foldable laptop have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

Q73. What would you expect the audio quality to be of a foldable laptop?

	Excellent	Good	Average	Poor	Terrible
Audio quality	0	0	•	0	0

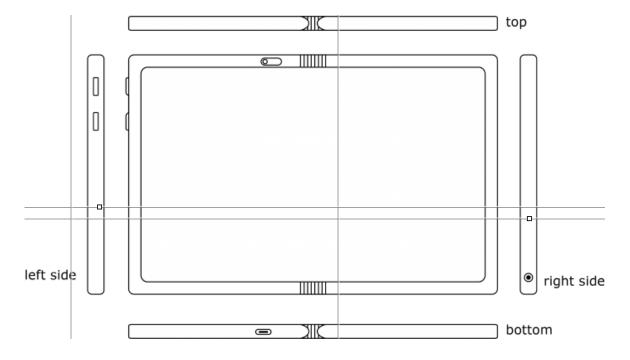
Q37. How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Laptop	1
Foldable laptop	2
Smartphone	3

tablet but the screen can be folded in half to reduce the size. When the tablet is fully folded open the screen is 13 inches, but the tablet can also be used in a small laptop position. Each half is turned into a 9 inch screen, which can be compared to a small tablet.



Q46. Where do you expect the speakers are placed in a foldable tablet? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q47. What would you expect from the speakers of the foldable tablet compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

	le around you. Big scre				
Q48. Would the foldable tal	olet have a mono	or stereo spea	ker setup?		
○ Mono					
<ul><li>Stereo</li></ul>					
Mono, but the sound changes	s with the orientation o	f the device			
<ul> <li>Stereo, but the sound change</li> </ul>	es with the orientation of	of the device			
Q72. What would you expe	ct the audio qual	ity to be of a fol	dable tablet?		
	Excellent	Good	Average	Poor	Terrible
idio quality			•		
Laptop					1
Foldable tablet					2
Foldable tablet Smartphone					3
Smartphone  251. Lastly we would like to formation anonymous so	it cannot be liked				3
Smartphone  251. Lastly we would like to formation anonymous so  231. What would you state	it cannot be liked				3
Smartphone  251. Lastly we would like to formation anonymous so	it cannot be liked				3
Smartphone  251. Lastly we would like to formation anonymous so  231. What would you state  Male	it cannot be liked				3
Smartphone  Q51. Lastly we would like to formation anonymous so  Q31. What would you state  Male Female	it cannot be liked				3
Smartphone  Q51. Lastly we would like to formation anonymous so  Q31. What would you state  Male Female Other I do not want to disclose this	it cannot be liked				3
Smartphone  Q51. Lastly we would like to formation anonymous so  Q31. What would you state  Male Female Other	it cannot be liked				3
Smartphone  251. Lastly we would like to formation anonymous so  231. What would you state  Male Female Other I do not want to disclose this	it cannot be liked				3
Smartphone  251. Lastly we would like to formation anonymous so  231. What would you state  Male Female Other I do not want to disclose this	it cannot be liked is your gender?	to you as state			3

Q78. What is the main advantage of a foldable tablet compared to a normal tablet in your eyes?

0.34	How	would	VOL	rate	vour	hearir	na?
QUT.	1 10 44	Would	you	Tate	your	Hoain	19:

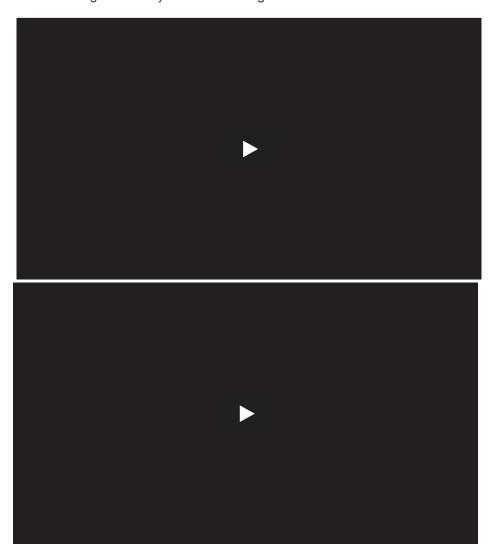
	Excellent	G000	Average	Poor	ierribie
Click to write Statement 1	0	•		0	
Q52. Check the boxes that	apply to you				
✓ Before this survey I was alrea	ady familiar with foldabl	e tablets and laptop	os		
✓ I would consider myself up to	date on technology tre	ends			
☐ I like to buy the newest perso	onal mobile devices who	en they are released	i		
Q100. Is there anything you itself? If not you can submit				f the survey or	the survey
nine aument					
nice survey!					

Q109. For SurveyCircle users (www.surveycircle.com): The Survey Code is: G3LH-YBVM-Y719-SWNU or click the following link:  $\frac{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}$ 

## 8.10.7 User test results participant 7

*Introduction*. Thank you for participating in this research about expectations for speakers in personal mobile devices. With personal mobile devices we mean either laptops, smarphones or tablets. This research will take approximately **15 to 30 minutes**, based on the amount of devices you participate with.

To participate in this survey we want you to have **access to at least two** (but preferably all) of the following mobile devices: a **tablet**, **laptop**, **portable speaker and/or smartphone**. These devices are needed to watch video's on YouTube on to rate the audio quailty of each seperate device. The video's you will use during this survey are the following:



These video's will also be available for the related questions, but only for the device you take the survey on. For your other devices we recommend you to use the titel of the video to find it on YouTube, scan the QR code or type the following links in your browser:

- https://www.youtube.com/watch?v=Vt4CEfMTLJc " Queen Bohemian Rhapsody (HQ) "
- https://www.youtube.com/watch?v=6TWJaFD6R2s " #Stereo: Left and Right Stereo Sound Test "

It is advised to test the video's on all devices before you continue with the survey and to make sure you are in an area in which you can play the audio at a audible level. The audio should be played through the speakers of the device itself, so not trough headphones or external speakers that are connected to the device.

All the information that is gathered in this survey will be kept confidential and your results are anonymous, non of these results can be linked back to you.

Devices used. State the devices you have access to to use during this research.

✓ Portable speaker
Tablet brand. Which brand and type of tablet do you own? (if you have multiple tablets only state the one you will be using during this research)
This question was not displayed to the respondent.
Q55. How would you rank your tablet compared to other tablets on the market when you bought the tablet?
This question was not displayed to the respondent.
Q74. In which year did you buy your tablet?
This question was not displayed to the respondent.
Smartphone brand. Which <u>brand</u> and <u>type</u> of smartphone do you own? (if you have multiple smartphones only <u>state the one you will be using</u> during this research)
Iphone 7
<ul> <li>Q56. How would you rank your smartphone compared to other smartphones on the market when you bought the smartphone?</li> <li>High-end smartphone</li> <li>Mid-range smartphone</li> <li>Low-end smartphone</li> </ul>
Q75. In which year did you buy your smartphone?
2020
Laptop brand. Which <u>brand</u> and <u>type</u> of laptop do you own? (if you have multiple laptops only <u>state the</u> <u>one you will be using</u> during this research)
MacBook Air
Q57. How would you rank your laptop compared to other laptops on the market when you bought the laptop?
○ High-end laptop
Mid-range laptop
Low-end laptop
Q76. In which year did you buy your laptop?
2017

SmartphoneLaptop

Q102. Which <u>brand</u> and <u>type</u> of portable speaker do you own? (if you have portable speakers only <u>state</u> <u>the one you will be using</u> during this research)

Gecko BS050	

Q103. How would you rank your portable speaker compared to other portable speakers on the market when you bought the portable speaker?

- High-end portable speaker
- Mid-range portable speaker
- Low-end portable speaker

Q104. In which year did you buy your portable speaker?

2017	

Speaker position. Indicate in which area the speakers of your tablet are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

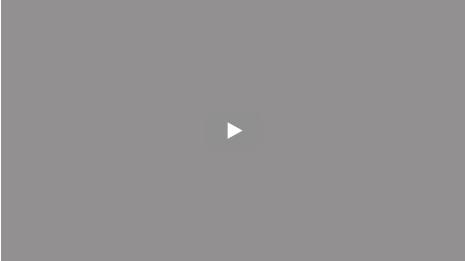
This question was not displayed to the respondent.

Q9. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



Or with by playing the video



This question was not displayed to the respondent.

Q13. Did you take the speakers and sound quality into acount when buying your tablet?

Q38. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the tablet, external speakers connected to the tablet or headphones that are connected to the tablet via either bluethooth or cable.

This question was not displayed to the respondent.

Q61. What is the reason for your choice in setup when watching YouTube?

This question was not displayed to the respondent.

Q58. What is the reason for your choice in setup when browsing social media?

This question was not displayed to the respondent.

Q59. What is the reason for your choice in setup when listening to music?

This question was not displayed to the respondent.

Q60. What is the reason for your choice in setup when watching Netflix or online television?

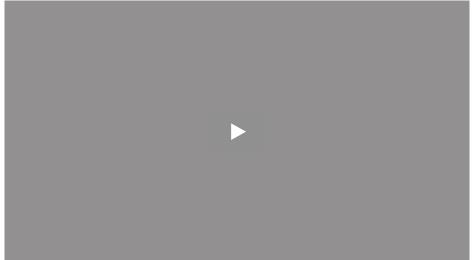
This question was not displayed to the respondent.

Q14. After listening to the song on your tablet, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ))
- By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q15. Describe <u>positive aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

*Q16.* Describe <u>negative aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q17. If you could change anything about the sound performance of your tablet what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

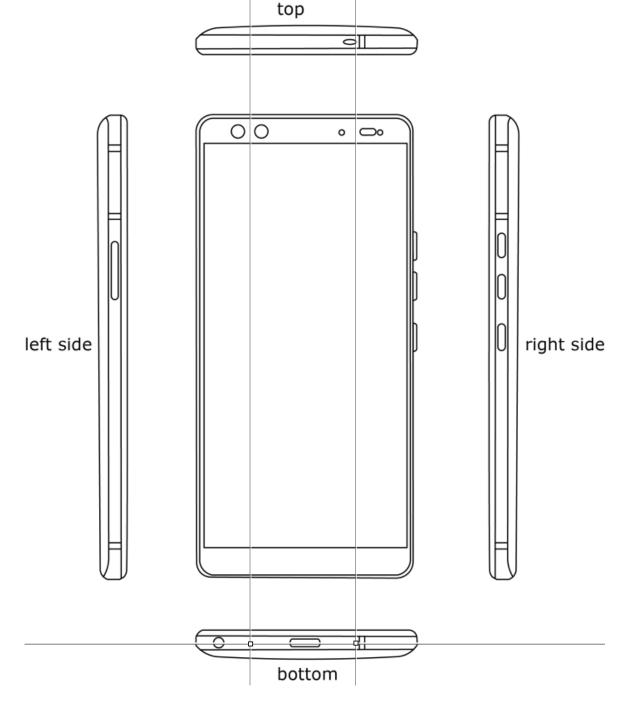
Q79. I would pay ... dollar/euro more for a tablet to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q80. I would be willing to choose a tablet that is ... milimeter (1 mm is 0.04 inch) thicker than my current tablet to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker tablet for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q25. Indicate in which area the speakers of your smartphone are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 2 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

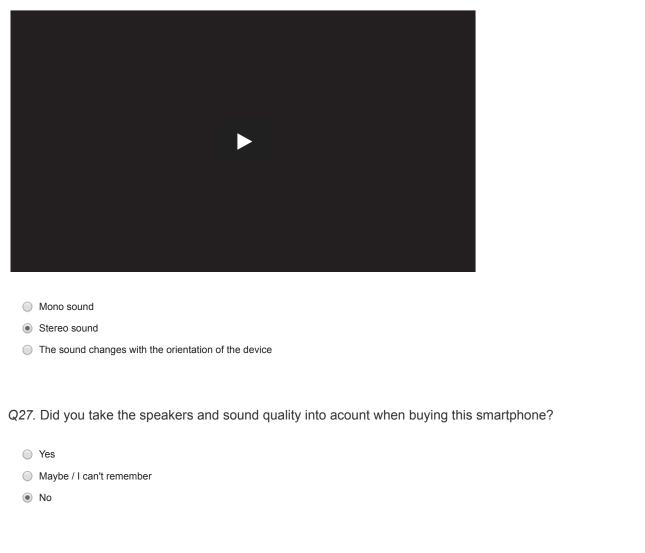


Q26. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
  By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



· Or with by playing the video



Q62. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the smartphone, external speakers connected to the smartphoneor headphones that are connected to the smartphonevia either bluethooth or cable.

	I would play the audio via the speaker of my smartphone	I would play the audio from headphones connected to my smartphone	I would play the audio from external speakers connected to my smartphone
Watching YouTube	0	•	
Browsing social media (Facebook, Instragram, etc)	•	0	$\circ$
Listening to music	0	•	$\circ$
Watching Netflix or online television		•	
(Video) calling	0	•	0

Q63. What is the reason for your choice in setup when watching YouTube?

I don't want to bother other people
I don't want other people to bother me
I can hear the audio better
The sound quality is better
Too much hassle to get another speaker or headphone
The sound quality is good as it is without the need for extra device.
Other

Q64. What is the reason for your choice in setup when **browsing social media**?

$\bigcirc$	The sound quality is better
•	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
0	Other
Q65.	What is the reason for your choice in setup when <u>listening to music</u> ?
$\bigcirc$	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q66.	What is the reason for your choice in setup when watching Netflix or online television?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
$\bigcirc$	Other
one t	After listening to the song on your smartphone, how do you rate the audio quality on a scale from o five? You can test this with:  The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )  By typing the title in the search bar ( <a href="Queen - Bohemian Rhapsody">Queen - Bohemian Rhapsody</a> (HQ).)  By scanning the QR code  Or with by playing the video

 $\hfill \bigcirc$  I don't want other people to bother me

O I can hear the audio better

		$\circ$		$\circ$	•	)						
Q29. Describe <u>positive</u> as leave this field blank. As a Deep, Smooth, Punchy, W Harsh, Distorted.	n examı	ole you ca	an use v	vords su	ch as: Cle	ean, Full,	Strong, 0	Clear, Spa	acious,			
Clean, Smooth												
Q30. Describe <u>negative</u> a leave this field blank. As a Deep, Smooth, Punchy, W Harsh, Distorted.	n examı	ole you ca	an use v	vords su	ch as: Cle	ean, Full,	Strong, 0	Clear, Spa	acious,	ı		
Dull, Spacious, Soft												
Q31. If you could change a you would not change any						our smar	tphone w	hat would	d it be? If		7	
										adjust the	slider to	the
right amount. If you would	not war	nt to pay i	more for	a better	sound pe	erformand	ce set the	slider to	0.			the
Q84. I would pay dollar/right amount. If you would	not war									adjust the	slider to	the 0
Price increase  Q85. I would be willing to omake the previously stated	not war	20 a smartples possib	40 hone tha	60 at is m	80  ilimeter (*der to the	100 1 mm is 0	120	slider to	160	180 urrent sm	200 artphone	o e to
Price increase  Q85. I would be willing to omake the previously stated smartphone for a better so	not war	20 a smartples possib	40 hone tha	60 at is m	80  ilimeter (*der to the	100 1 mm is 0	120	slider to	160	180 urrent sm	200 artphone	o e to

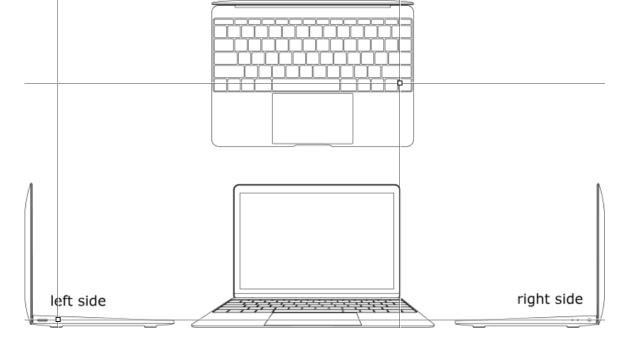
Terrible

Poor

Average

Excellent

Good

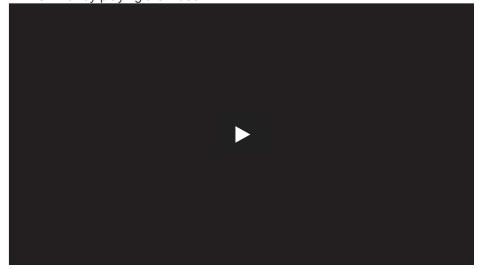


Q19. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( <u>#Stereo: Left and Right Stereo Sound Test</u> )
- · By scanning the QR code



• Or with by playing the video



- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q20. Did you take the speakers and sound quality into acount when buying this laptop?

- Yes
- Maybe / I can't remember
- No

Q67. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the laptop, external speakers connected to the laptop or headphones that are connected to the laptop via either bluethooth or cable.

	I would play the audio via the speaker of my laptop	I would play the audio from headphones connected to my laptop	I would play the audio from external speakers connected to my laptop
Watching YouTube	0	•	
Browsing social media (Facebook, Instragram, etc)	•		0
Listening to music		•	
Watching Netflix or online television		•	
(Video) calling		•	

Watering TouTube			
Browsing social media (Facebook, Instragram, etc)	•	0	0
Listening to music		•	$\circ$
Watching Netflix or online television	0	•	0
(Video) calling	0		0
Q68. What is the reason fo  I don't want to bother other p	eople	en <b>watching YouTube</b> ?	
<ul><li>I can hear the audio better</li></ul>			
The sound quality is better			
Too much hassle to get anoth	her speaker or headphone		
	it is without the need for extra dev	ices	
Other			
Q69. What is the reason fo  I don't want to bother other p  I don't want other people to b  I can hear the audio better  The sound quality is better  Too much hassle to get anott  The sound quality is good as  Other	eople pother me		?
Q70. What is the reason fo	r your choice in setup whe	en listening to music?	
<ul> <li>I don't want to bother other p</li> </ul>	eople		
<ul> <li>I don't want other people to b</li> </ul>	oother me		
<ul> <li>I can hear the audio better</li> </ul>			
The sound quality is better			
<ul> <li>Too much hassle to get anoth</li> </ul>	·		
	it is without the need for extra dev	ices	
Other			
Q71. What is the reason fo	r your choice in setup whe	en <b>watching Netflix or onl</b> i	ine television?

	I don't	want	to	bother	other	people
--	---------	------	----	--------	-------	--------

I don't want other people to bother me

I can hear the audio better The sound quality is better

<ul> <li>The stereo test link (</li> <li>By typing the title in the By scanning the QR of</li> </ul>	he search bar ( <u>Qı</u>	be.com/watch?	v=Vt4CEfMTLJc		Trom one to
Or with by playing the	video				
dio quality	Excellent	Good	Average	Poor	Terrible
222. Describe <u>positive</u> as nis field blank. As an exan mooth, Punchy, Wide, Ag istorted.	nple you can use	words such as:	Clean, Full, Stror	ng, Clear, Spac	ious, Deep,
Q23. Describe <u>negative</u> as his field blank. As an exan Smooth, Punchy, Wide, Ag Distorted.	nple you can use v	words such as:	Clean, Full, Stror	ng, Clear, Spac	ious, Deep,

 $\hfill \bigcirc$  Too much hassle to get another speaker or headphone

Other

O The sound quality is good as it is without the need for extra devices

Q82. I would pay ... dollar/euro more for a laptop to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

0	) 2	0 60	80	100	120	140	160	180	200	
Price increase										0

Q83. I would be willing to choose a laptop that is ... milimeter (1 mm is 0.04 inch) thicker than my current laptop to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker laptop for a better sound performance set the slider to 0.

(	0 2	2 .	4 6	3	3	10	12	14	16	20
Thickness increase										0

Q92. Check the boxes that apply for the purchase of your portable speaker

Sound	quality
-------	---------

- Size
- Price
- Design
- Build in light feature
- Bluethooth
- Connect multiple speakers toghether
- Charge phone with portable speaker
- Other It was a present
- None of the above

Q97. In which scenario's do you use your portable speaker?

- Play music at a party
- ✓ Play music in a park/garden
- Play music in everyday use
- Play audio of movie or televison
- Use during (video) calls
- Sound during presentations or meetings
- As sound improvement during laptop use
- As sound improvement during tablet use
- As sound improvement during smartphone use
- Other
- None of the above

Q91. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



• Or with by playing the video



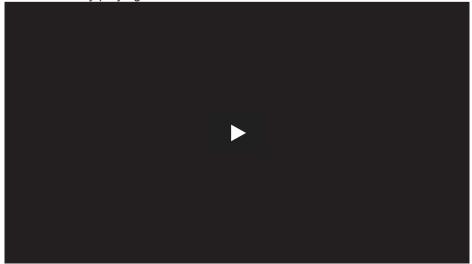
- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q98. After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )
- By typing the title in the search bar ( <u>Queen Bohemian Rhapsody (HQ)</u>)
- By scanning the QR code



• Or with by playing the video



	Excellent	Good	Average	Poor	Terrible
Audio quality		•			

Q99. Describe **positive** aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Loud, Clean, Full, Strong

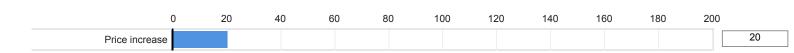
Q100. Describe <u>negative</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Crunchy when too load, not enough bass.

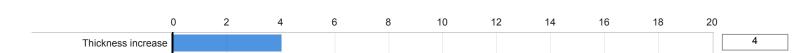
Q101. If you could change anything about the sound performance of your portable speaker what would it be? If you would not change anything you can leave this field blank.



Q102. I would pay ... dollar/euro more for a portable speaker to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q103. I would be willing to choose a portable speaker that is ... centimeter (1 cm is 0.4 inch) thicker than my current portable speaker to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker portable speaker for a better sound performance set the slider to 0.

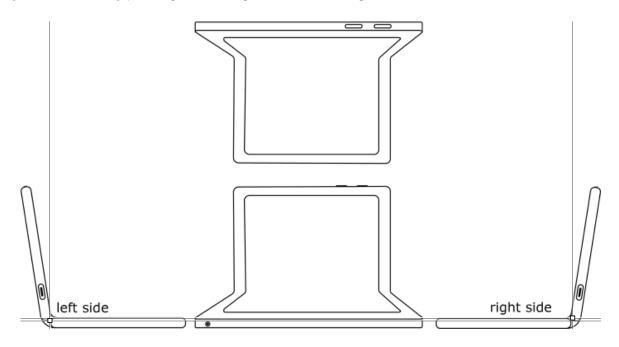


## Q28.

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable laptop. This device has the same specifications as a well performing laptop but the screen covers the whole area of the laptop where the keyboard used to be. When the laptop is folded open in the laptop position the top of the screen can be compared to a regular tablet screen with another tablet screen as a keyboard. If the laptop is fully folded open it transforms in a 17 inch screen.



Q10. Where do you expect the speakers are placed in a foldable laptop? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q35. What would you expect from the speakers of the foldable laptop compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Surround sound	

Q77. What is the main advantage of a foldable laptop compared to a normal laptop in your eyes?

You can take it anywhere.		
Tou our tand it arry miles or		

Q36. Would the foldable laptop have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

	Excellent	Good	Average	Poor	Terrible
Audio quality			•		

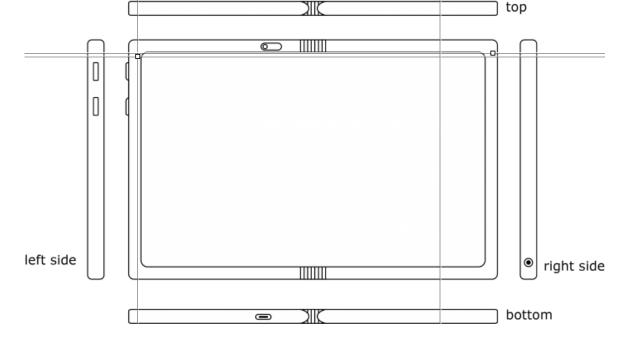
Q37. How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Portable speaker	1
Smartphone	2
Foldable laptop	3
Laptop	4

Q45. In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable tablet. This device has the same specifications as a well performing tablet but the screen can be folded in half to reduce the size. When the tablet is fully folded open the screen is 13 inches, but the tablet can also be used in a small laptop position. Each half is turned into a 9 inch screen, which can be compared to a small tablet.



Q46. Where do you expect the speakers are placed in a foldable tablet? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q47. What would you expect from the speakers of the foldable tablet compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Not as loud as the other ones.

Q78. What is the main advantage of a foldable tablet compared to a normal tablet in your eyes?

It gets smaller?

Q48. Would the foldable tablet have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- O Stereo, but the sound changes with the orientation of the device

#### Q72. What would you expect the audio quality to be of a foldable tablet?

	Excellent	Good	Average	Poor	Terrible
Audio quality			•		

Q108. How would you rank the foldable tablet compared to your devices, based on your expectations about the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst speakers.



Q31. What would you stat	e is your gender?				
<ul><li>Male</li></ul>					
Female					
Other					
I do not want to disclose this	s				
Q32. How old are you?					
22					
22					
Q33. What would you stat	e is your nationali	ty?			
Dutch					
Q34. How would you rate	your hearing?				
Q34. How would you rate	your hearing?	Good	Average	Poor	Terrible
•		Good	Average	Poor	Terrible
lick to write Statement 1  Q52. Check the boxes tha	Excellent  t apply to you	•			
lick to write Statement 1	Excellent  t apply to you  eady familiar with foldab	ele tablets and laptop:			
lick to write Statement 1  Q52. Check the boxes that  Before this survey I was alr	Excellent  t apply to you  eady familiar with foldab to date on technology tree	ends	S		
© Before this survey I was alr  I would consider myself up  I like to buy the newest pers	t apply to you eady familiar with foldabeto date on technology tresonal mobile devices who	ends     ene they are released t us know either	s about the topic o		
Plick to write Statement 1  Q52. Check the boxes that  ■ Before this survey I was alr  ■ I would consider myself up  □ I like to buy the newest pers	Excellent  t apply to you  eady familiar with foldab to date on technology tre sonal mobile devices where ou would like to let it the survey by cl	ends     ent they are released     tus know either icking on next b	about the topic outton.	of the survey or	the survey
I would consider myself up     I like to buy the newest personal     I like to buy the new th	Excellent  t apply to you  eady familiar with foldab to date on technology tre sonal mobile devices where ou would like to let it the survey by cl	ends     ent they are released     tus know either icking on next b	about the topic outton.	of the survey or	the survey

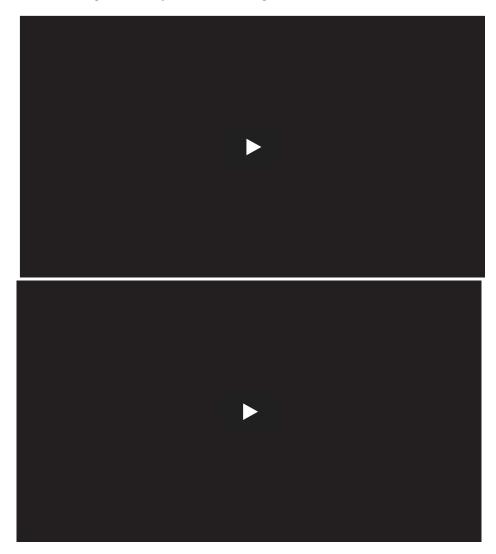
Q51. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.

Q109. For SurveyCircle users (www.surveycircle.com): The Survey Code is: G3LH-YBVM-Y719-SWNU or click the following link: <a href="https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU">https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU</a>

## 8.10.8 User test results participant 8

*Introduction.* Thank you for participating in this research about expectations for speakers in personal mobile devices. With personal mobile devices we mean either laptops, smarphones or tablets. This research will take approximately **15 to 30 minutes**, based on the amount of devices you participate with.

To participate in this survey we want you to have **access to at least two** (but preferably all) of the following mobile devices: a **tablet**, **laptop**, **portable speaker and/or smartphone**. These devices are needed to watch video's on YouTube on to rate the audio quailty of each seperate device. The video's you will use during this survey are the following:



These video's will also be available for the related questions, but only for the device you take the survey on. For your other devices we recommend you to use the titel of the video to find it on YouTube, scan the QR code or type the following links in your browser:

- https://www.youtube.com/watch?v=Vt4CEfMTLJc " Queen Bohemian Rhapsody (HQ) "
- https://www.youtube.com/watch?v=6TWJaFD6R2s "#Stereo: Left and Right Stereo Sound Test"

It is advised to test the video's on all devices before you continue with the survey and to make sure you are in an area in which you can play the audio at a audible level. The audio should be played through the speakers of the device itself, so not trough headphones or external speakers that are connected to the device.

All the information that is gathered in this survey will be kept confidential and your results are anonymous, non of these results can be linked back to you.

Devices used. State the devices you have access to to use during this research.

✓ Portable speaker
Tablet brand. Which brand and type of tablet do you own? (if you have multiple tablets only state the one you will be using during this research)
This question was not displayed to the respondent.
Q55. How would you rank your tablet compared to other tablets on the market when you bought the tablet?
This question was not displayed to the respondent.
Q74. In which year did you buy your tablet?
This question was not displayed to the respondent.
Smartphone brand. Which <u>brand</u> and <u>type</u> of smartphone do you own? (if you have multiple smartphones only <u>state the one you will be using</u> during this research)
Xiaomi Mi 9 SE
<ul> <li>High-end smartphone</li> <li>Mid-range smartphone</li> <li>Low-end smartphone</li> </ul>
Q75. In which year did you buy your smartphone?
2020
Laptop brand. Which <u>brand</u> and <u>type</u> of laptop do you own? (if you have multiple laptops only <u>state the</u> <u>one you will be using</u> during this research)
Apple Macbook Pro 15 inch
Q57. How would you rank your laptop compared to other laptops on the market when you bought the laptop?
High-end laptop
Mid-range laptop
Low-end laptop
Q76. In which year did you buy your laptop?
2013

SmartphoneLaptop

Q102. Which <u>brand</u> and <u>type</u> of portable speaker do you own? (if you have portable speakers only <u>state</u> the one you will be using during this research)

BL Flip 4

Q103. How would you rank your portable speaker compared to other portable speakers on the market when you bought the portable speaker?

- High-end portable speaker
- Mid-range portable speaker
- Low-end portable speaker

Q104. In which year did you buy your portable speaker?

017

Speaker position. Indicate in which area the speakers of your tablet are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

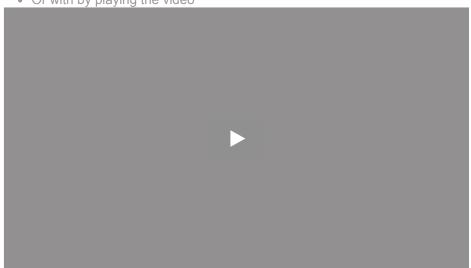
This question was not displayed to the respondent.

Q9. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q13. Did you take the speakers and sound quality into acount when buying your tablet?

Q38. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the tablet, external speakers connected to the tablet or headphones that are connected to the tablet via either bluethooth or cable.

This question was not displayed to the respondent.

Q61. What is the reason for your choice in setup when watching YouTube?

This question was not displayed to the respondent.

Q58. What is the reason for your choice in setup when **browsing social media**?

This question was not displayed to the respondent.

Q59. What is the reason for your choice in setup when listening to music?

This question was not displayed to the respondent.

Q60. What is the reason for your choice in setup when watching Netflix or online television?

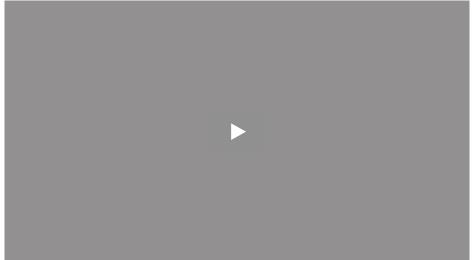
This question was not displayed to the respondent.

Q14. After listening to the song on your tablet, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <u>https://www.youtube.com/watch?v=Vt4CEfMTLJc</u> )
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ))
- · By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q15. Describe <u>positive aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

*Q16.* Describe <u>negative aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q17. If you could change anything about the sound performance of your tablet what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

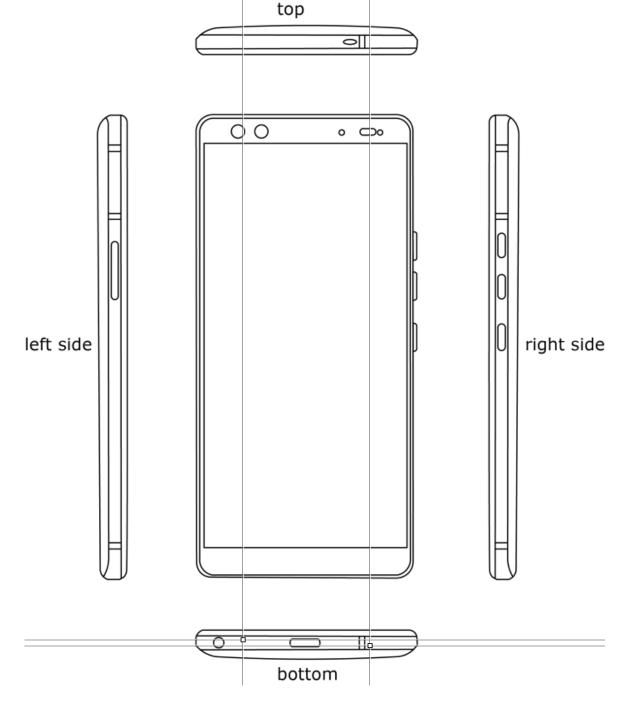
Q79. I would pay ... dollar/euro more for a tablet to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q80. I would be willing to choose a tablet that is ... milimeter (1 mm is 0.04 inch) thicker than my current tablet to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker tablet for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q25. Indicate in which area the speakers of your smartphone are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 2 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

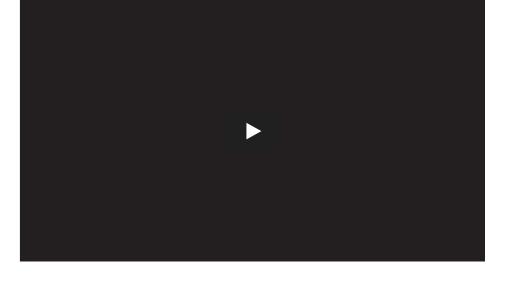


Q26. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
  By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



• Or with by playing the video



_			
	Mono	SOLI	nd

Q27. Did you take the speakers and sound quality into acount when buying this smartphone?

Yes

Maybe / I can't remember

No

Q62. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the smartphone, external speakers connected to the smartphoneor headphones that are connected to the smartphonevia either bluethooth or cable.

	I would play the audio via the speaker of my smartphone	I would play the audio from headphones connected to my smartphone	I would play the audio from external speakers connected to my smartphone
Watching YouTube	•	0	0
Browsing social media (Facebook, Instragram, etc)	•		0
Listening to music		•	
Watching Netflix or online television			•
(Video) calling		•	

Q63. What is the reason for your choice in setup when watching YouTube?

_							
	ı	don't	want	to	hother	other	people

- I don't want other people to bother me
- I can hear the audio better
- The sound quality is better
- Too much hassle to get another speaker or headphone
- The sound quality is good as it is without the need for extra devices

	Other	
$\bigcirc$	Other	

Q64. What is the reason for your choice in setup when browsing social media?

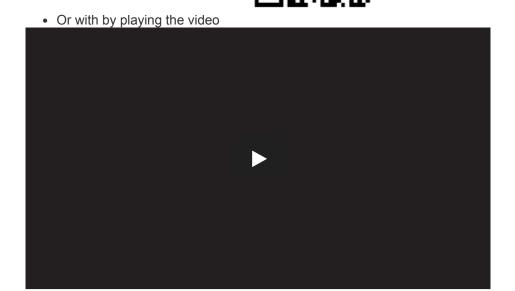
○ I don't want to bother other people 311

Stereo sound

The sound changes with the orientation of the device

$\bigcirc$	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q65.	What is the reason for your choice in setup when <u>listening to music</u> ?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
$\bigcirc$	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q66.	What is the reason for your choice in setup when watching Netflix or online television?  I don't want to bother other people I don't want other people to bother me I can hear the audio better The sound quality is better Too much hassle to get another speaker or headphone The sound quality is good as it is without the need for extra devices Other
one i	After listening to the song on your smartphone, how do you rate the audio quality on a scale from to five? You can test this with:  The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )  By typing the title in the search bar ( <a href="Queen - Bohemian Rhapsody">Queen - Bohemian Rhapsody</a> (HQ)  By scanning the QR code

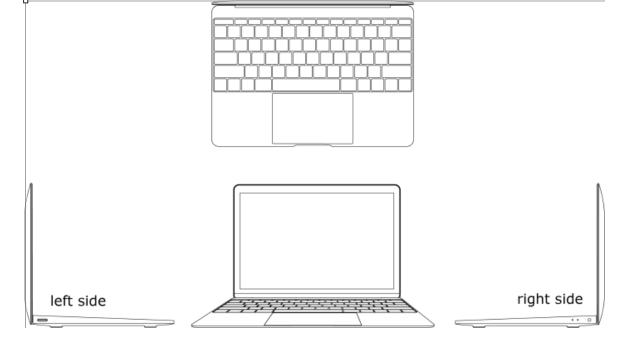
I don't want other people to bother me



		Excellent	Good	Avera	ge	Poor		Terrible		
udio quality			0	•		0				
Q29. Describe <b>posi</b>	tive aspects	about the	audio quality o	of your smar	tphone. If	there are	not any	you can		
leave this field blank Deep, Smooth, Pun	k. As an exa	mple you o	can use words	such as: Cle	an, Full,	Strong, Cle	ear, Spa	cious,		
Harsh, Distorted.	city, vvide, A	rggressive	, Dright, Synthe	stic, Cruncity	, Loud, N	iaiiow, iiii	ii, Duii, i	uzzy,		
										_
Clear										
Q30. Describe nega	ative aspect	s about the	e audio quality	of your sma	rtphone. I	f there are	not any	you can		
leave this field blank Deep, Smooth, Pun	k. As an exa	mple you	can use words	such as: Cle	an, Full,	Strong, Cle	ear, Spa	cious,		
Harsh, Distorted.	city, vvide, A	aggressive	, bright, Synthe	elic, Cruncity	/, Louu, N	iaiiow, iiii	II, Dull, F	uzzy,		
Empty, Thin										
Q31. If you could ch	nange anvthi	ing about t	he sound perfo	rmance of v	our smar	bhone wh	at would	it be? If		
you would not chang					our ornar	.priorio win	at Would			
										1
More "warm" sounds. L	ower frequencie	es								
Q84. I would pay	dollar/ouro	more for a	smartnhono to	make the n	roviouely	stated sha	naoc no	cciblo A	diust the	clidar to the
right amount. If you									ajust trie	Silder to the
	0	20	40 60	80	100	120	140	160	180	200
Price i	ncrease									10
Q85. I would be willi make the previously										
smartphone for a be						- 300 111 1111		,		
	0	2	4 6	8	10	12	14	16	18	20

Q18. Indicate in which area the speakers of your laptop are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

Thickness increase

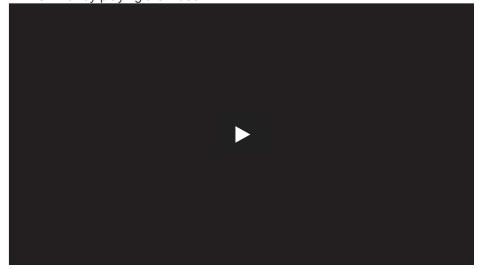


Q19. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( <u>#Stereo: Left and Right Stereo Sound Test</u> )
- · By scanning the QR code



• Or with by playing the video



- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q20. Did you take the speakers and sound quality into acount when buying this laptop?

- Yes
- Maybe / I can't remember
- No

Q67. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the laptop, external speakers connected to the laptop or headphones that are connected to the laptop via either bluethooth or cable.

	I would play the audio via the speaker of my laptop	I would play the audio from headphones connected to my laptop	I would play the audio from external speakers connected to my laptop
Watching YouTube	•	0	0
Browsing social media (Facebook, Instragram, etc)	•		
Listening to music	0		•
Watching Netflix or online television			•
(Video) calling		•	

(Facebook, Instragram, etc)	•	O	O
Listening to music	0		•
Watching Netflix or online television	0	0	•
(Video) calling	0	•	
Q68. What is the reason fo  I don't want to bother other p	people	en <b>watching YouTube</b> ?	
I can hear the audio better			
The sound quality is better			
Too much hassle to get anot!	her speaker or headphone		
<ul><li>The sound quality is good as</li></ul>	it is without the need for extra dev	vices	
Other			
I don't want to bother other p I don't want other people to b I can hear the audio better The sound quality is better Too much hassle to get another	people pother me	en <u>browsing social media</u> ?	
Q70. What is the reason fo		en <u>l<b>istening to music</b>?</u>	
I don't want to bother other p			
I don't want other people to be	oother me		
I can hear the audio better			
The sound quality is better	har anagkar ar handahan		
Too much hassle to get anoth		ijoes	
	s it is without the need for extra dev	//UCS	
Other			

Q71. What is the reason for your choice in setup when watching Netflix or online television?

$\bigcirc$	I don't want	to	bother	other	people

I don't want other people to bother me

I can hear the audio better

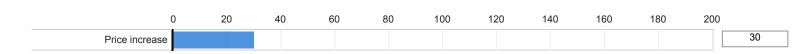
The sound quality is better

<ul> <li>Too much hassle to get anot</li> </ul>	ner speaker or headpho	one			
The sound quality is good as	it is without the need f	or extra devices			
Other					
221. After listening to the s	song on vour lapte	op. how do vou	rate the audio ou	uality on a scale	from one to
ve? You can test this with	:		·	•	
The stereo test link ( ]      The stereo test link ( ]					
<ul><li>By typing the title in the</li><li>By scanning the QR of</li></ul>		<u>ueen - Bonemia</u>	an Rhapsody (HC	<u>( )_)</u> .	
		Second Control			
	므	تعاولات			
	H3	arush - 47			
	<u> </u>	990	!		
		6-4-4			
<ul> <li>Or with by playing the</li> </ul>	video				
71 7 0					
	Excellent	Good	Average	Poor	Terrible
idio quality	0	0	(a)	0	
alo quality			•		
)22. Describe <b>positive</b> as	pects about the a	udio quality of v	our laptop. If the	re are not any v	ou can leave
nis field blank. As an exan	nple you can use	words such as:	Clean, Full, Stro	ng, Clear, Spac	ious, Deep,
Smooth, Punchy, Wide, Ag	gressive, Bright,	Synthetic, Crun	chy, Loud, Narro	w, Thin, Dull, Fu	ızzy, Harsh,
Distorted.					
Clear Datailed warmer than am	ortobono				
Clear, Detailed, warmer than sm	artpnone				
023. Describe <u>negative</u> as his field blank. As an exan					
Smooth, Punchy, Wide, Ag					
Distorted.	g. 555.75, Drignit, (	-,	,, <u></u> , radilo	,, Dan, I C	,
not immersive, stereo doesn't wo	ork very well, not hearir	ng everything but rais	sing volume will not ma	ike it better.	
)24 If you could change a	invthing about the	s cound porform	nance of your long	ton what would	it he? If you
Q24. If you could change a vould not change anything			iance or your iap	top wriat would	it be : ii you

Better surround-ish sound. More warm sounds

316

Q82. I would pay ... dollar/euro more for a laptop to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q83. I would be willing to choose a laptop that is ... milimeter (1 mm is 0.04 inch) thicker than my current laptop to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker laptop for a better sound performance set the slider to 0.

	0	2	4	6	8	10	12	14	16	18	20	
Thickness increase												1

Q92. Check the boxes that apply for the purchase of your portable speaker

<b>✓</b>	Sound	quality
----------	-------	---------

- ✓ Size
- Price
- Design
- Build in light feature
- Bluethooth
- Connect multiple speakers toghether
- Charge phone with portable speaker
- Other
- None of the above

Q97. In which scenario's do you use your portable speaker?

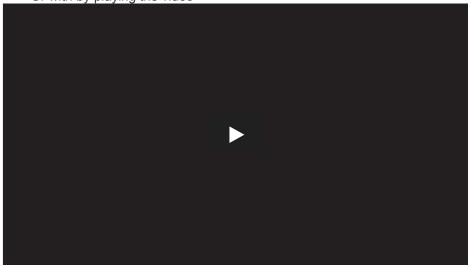
- ✓ Play music at a party
- ✓ Play music in a park/garden
- Play music in everyday use
- Play audio of movie or televison
- Use during (video) calls
- Sound during presentations or meetings
- As sound improvement during laptop use
- As sound improvement during tablet use
- As sound improvement during smartphone use
- Other
- None of the above

Q91. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



• Or with by playing the video



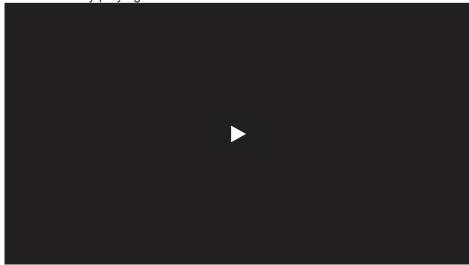
- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q98. After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )
- By typing the title in the search bar ( <u>Queen Bohemian Rhapsody (HQ)</u>)
- By scanning the QR code



• Or with by playing the video



	Excellent	Good	Average	Poor	Terrible
Audio quality	•				

Q99. Describe **positive** aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Strong, Spacious, reaches all frequencies, clear, warm. Turning it horizontal widens the sounds. Vertical orientation focusses the sound.

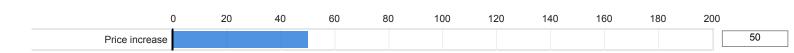
Q100. Describe <u>negative</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Lack of vibrating bass
Lack of vibrating bass.

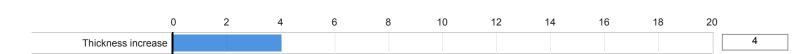
Q101. If you could change anything about the sound performance of your portable speaker what would it be? If you would not change anything you can leave this field blank.



Q102. I would pay ... dollar/euro more for a portable speaker to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q103. I would be willing to choose a portable speaker that is ... centimeter (1 cm is 0.4 inch) thicker than my current portable speaker to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker portable speaker for a better sound performance set the slider to 0.

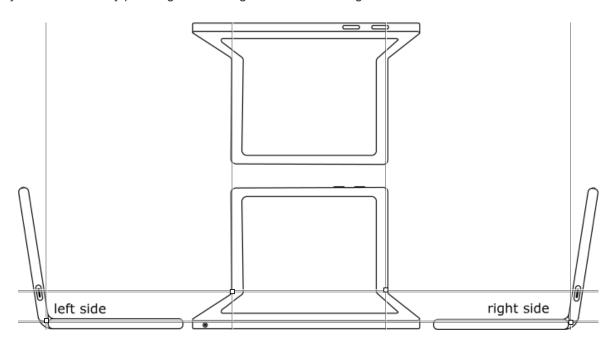


## Q28.

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable laptop. This device has the same specifications as a well performing laptop but the screen covers the whole area of the laptop where the keyboard used to be. When the laptop is folded open in the laptop position the top of the screen can be compared to a regular tablet screen with another tablet screen as a keyboard. If the laptop is fully folded open it transforms in a 17 inch screen.



Q10. Where do you expect the speakers are placed in a foldable laptop? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q35. What would you expect from the speakers of the foldable laptop compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Close to that of a laptop, probably a bit more bass as I quess the device is a bit thicker compared to most other laptops

Q77. What is the main advantage of a foldable laptop compared to a normal laptop in your eyes?

You can impress others with a cool new gadget.		

Q36. Would the foldable laptop have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

	Excellent	Good	Average	Poor	Terrible
Audio quality			•		

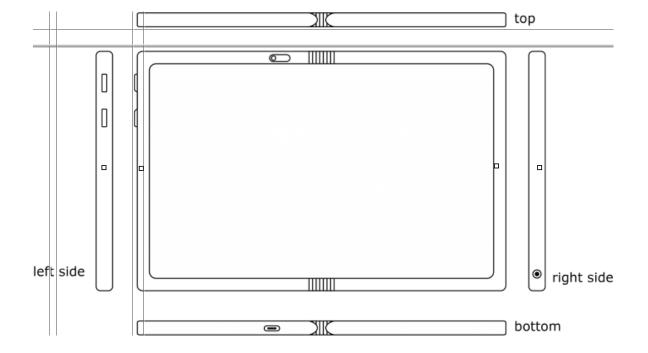
Q37. How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Portable speaker	1
Foldable laptop	2
Laptop	3
Smartphone	4

Q45. In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable tablet. This device has the same specifications as a well performing tablet but the screen can be folded in half to reduce the size. When the tablet is fully folded open the screen is 13 inches, but the tablet can also be used in a small laptop position. Each half is turned into a 9 inch screen, which can be compared to a small tablet.



Q46. Where do you expect the speakers are placed in a foldable tablet? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q47. What would you expect from the speakers of the foldable tablet compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Comparable to a smartphone, but since the tablet is rather big. It can make sense to put them in stereo position.	
osparasis to a sinar priorio, sat sinos tro tasis. Signit oan mario ositios to parario in tropico position.	

Q78. What is the main advantage of a foldable tablet compared to a normal tablet in your eyes?

Portability, Looks cool			

Q48. Would the foldable tablet have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

#### Q72. What would you expect the audio quality to be of a foldable tablet?

	Excellent	Good	Average	Poor	Terrible
Audio quality			•		

Q108. How would you rank the foldable tablet compared to your devices, based on your expectations about the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Portable speaker	1
Laptop	2
Foldable tablet	3
Smartphone	4

Q31. What would you state	e is your gender?				
<ul><li>Male</li></ul>					
○ Female					
Other					
I do not want to disclose this					
Q32. How old are you?					
Q32. How old are you!					
25					
Q33. What would you state	e is your nationalit	ty?			
Dutch					
Q34. How would you rate y	our hearing?				
	ı				
Click to write Statement 1	Excellent	Good	Average	Poor	Terrible
Short to write statement 1					O
Q52. Check the boxes that	apply to you				
☐ Before this survey I was alre	ady familiar with foldab	le tablets and laptops	6		
I would consider myself up to					
☐ I like to buy the newest person	onal mobile devices wh	en they are released			
Q100. Is there anything you	u would like to let	us know either	about the topic o	of the survey or	the survey
itself? If not you can submi	t the survey by cl	icking on next b	utton.		

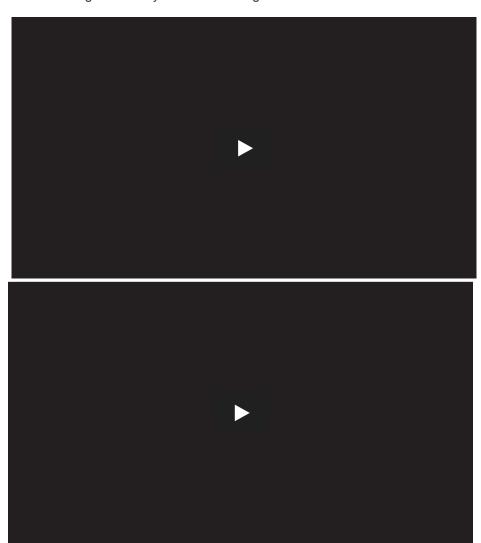
Q51. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.

Q109. For SurveyCircle users (www.surveycircle.com): The Survey Code is: G3LH-YBVM-Y719-SWNU or click the following link:  $\frac{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}$ 

# 8.10.9 User test results participant 9

Introduction. Thank you for participating in this research about expectations for speakers in personal mobile devices. With personal mobile devices we mean either laptops, smarphones or tablets. This research will take approximately 15 to 30 minutes, based on the amount of devices you participate with.

To participate in this survey we want you to have access to at least two (but preferably all) of the following mobile devices: a tablet, laptop, portable speaker and/or smartphone. These devices are needed to watch video's on YouTube on to rate the audio quailty of each seperate device. The video's you will use during this survey are the following:



These video's will also be available for the related questions, but only for the device you take the survey on. For your other devices we recommend you to use the titel of the video to find it on YouTube, scan the QR code or type the following links in your browser:

- https://www.youtube.com/watch?v=Vt4CEfMTLJc " Queen Bohemian Rhapsody (HQ) "
- https://www.youtube.com/watch?v=6TWJaFD6R2s " #Stereo: Left and Right Stereo Sound Test "

It is advised to test the video's on all devices before you continue with the survey and to make sure you are in an area in which you can play the audio at a audible level. The audio should be played through the speakers of the device itself, so not trough headphones or external speakers that are connected to the device.

All the information that is gathered in this survey will be kept confidential and your results are anonymous, non of these results can be linked back to you.

Devices used. State the devices you have access to to use during this research.

Tablet brand. Which brand and type of tablet do you own? (if you have multiple tablets only state the one you will be using during this research)
iPad Pro
Q55. How would you rank your tablet compared to other tablets on the market when you bought the tablet?
High-end tablet
Mid-range tablet
Low-end tablet
Q74. In which year did you buy your tablet?
2019
only state the one you will be using during this research)  iPhone Xr  Q56. How would you rank your smartphone compared to other smartphones on the market when you
bought the smartphone?
High-end smartphone
○ Mid-range smartphone
Low-end smartphone
Q75. In which year did you buy your smartphone?
2020
Laptop brand. Which <u>brand</u> and <u>type</u> of laptop do you own? (if you have multiple laptops only <u>state the</u> <u>one you will be using</u> during this research)
This question was not displayed to the respondent.
Q57. How would you rank your laptop compared to other laptops on the market when you bought the laptop?

This question was not displayed to the respondent.

Q76. In which year did you buy your laptop?

This question was not displayed to the respondent.

SmartphoneLaptop

Portable speaker

Q102. Which <u>brand</u> and <u>type</u> of portable speaker do you own? (if you have portable speakers only <u>state</u> <u>the one you will be using</u> during this research)

This question was not displayed to the respondent.

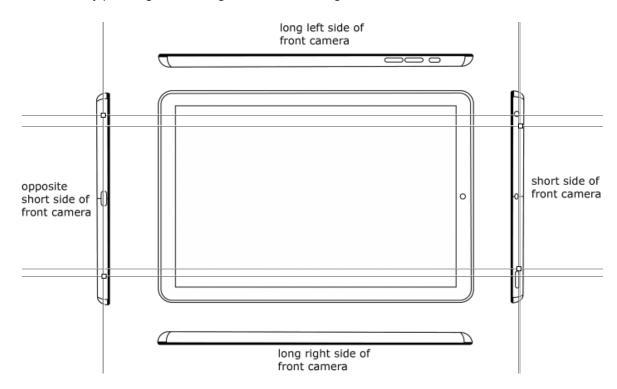
Q103. How would you rank your portable speaker compared to other portable speakers on the market when you bought the portable speaker?

This question was not displayed to the respondent.

Q104. In which year did you buy your portable speaker?

This question was not displayed to the respondent.

Speaker position. Indicate in which area the speakers of your tablet are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

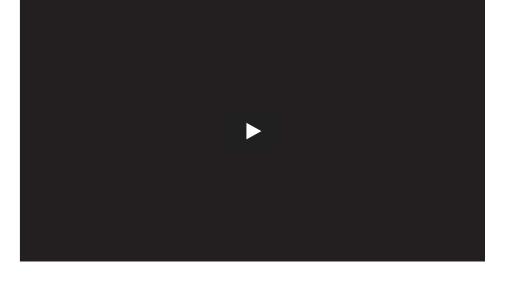


Q9. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



· Or with by playing the video



	Mono	sound
--	------	-------

- Stereo sound
- The sound changes with the orientation of the device

Q13. Did you take the speakers and sound quality into acount when buying your tablet?

- Yes
- Maybe / I can't remember
- No

Q38. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the tablet, external speakers connected to the tablet or headphones that are connected to the tablet via either bluethooth or cable.

	I would play the audio via the speaker of my tablet	I would play the audio from headphones connected to my tablet	I would play the audio from external speakers connected to my tablet
Watching YouTube	•	0	0
Browsing social media (Facebook, Instragram, etc)	•		
Listening to music	•		
Watching Netflix or online television	•		
(Video) calling	•		

Q61. What is the reason for your choice in setup when watching YouTube?

- I don't want to bother other people
- I don't want other people to bother me
- I can hear the audio better
- The sound quality is better
- Too much hassle to get another speaker or headphone
- The sound quality is good as it is without the need for extra devices
- Other Other

Q58. What is the reason for your choice in setup when browsing social media?

O I don't want to bother other people

$\bigcirc$	i don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
•	The sound quality is good as it is without the need for extra devices
	Other
Q59.	What is the reason for your choice in setup when listening to music?
	I don't want to bother other people
$\bigcirc$	I don't want other people to bother me
	I can hear the audio better
$\bigcirc$	The sound quality is better
$\bigcirc$	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q60.	What is the reason for your choice in setup when watching Netflix or online television?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
$\bigcirc$	Too much hassle to get another speaker or headphone
•	The sound quality is good as it is without the need for extra devices
$\bigcirc$	Other
	After listening to the song on your tablet, how do you rate the audio quality on a scale from o
ive?	You can test this with:

one to five? You can test this with:

The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)

By typing the title in the search bar ( <a href="Queen-Bohemian Rhapsody">Queen-Bohemian Rhapsody</a> (HQ)

By scanning the QR code

• Or with by playing the video



audio quality	0	•	0	0					
Q15. Describe positive as this field blank. As an exan Smooth, Punchy, Wide, Ag Distorted.	nple you can use	words such as: (	Clean, Full,	Strong, Clear,	Spacious	, Deep,			
Strong, Deep, smooth									
Q16. Describe <u>negative as</u> this field blank. As an exan Smooth, Punchy, Wide, Ag Distorted.	nple you can use	words such as: 0	Clean, Full,	Strong, Clear,	Spacious	, Deep,	÷	7	
Q17. If you could change a would not change anything			ance of you	ır tablet what w	rould it be?	? If you			
Q79. I would pay dollar/ amount. If you would not w	ant to pay more	for a better sound	d performa	nce set the slid	er to 0.				ight
Price increase	0 20	40 60	80	100 120	140	160	180	200	40
Q80. I would be willing to opreviously stated changes better sound performance	possible. Adjust set the slider to	the slider to the ri	ght increas	se in thickness.	. If you wo	uld not w	ant a thic	ker tabl	
	0 2	4 6	8	10 12	14	16	18	20	8
Thickness increase									<u> </u>

Poor

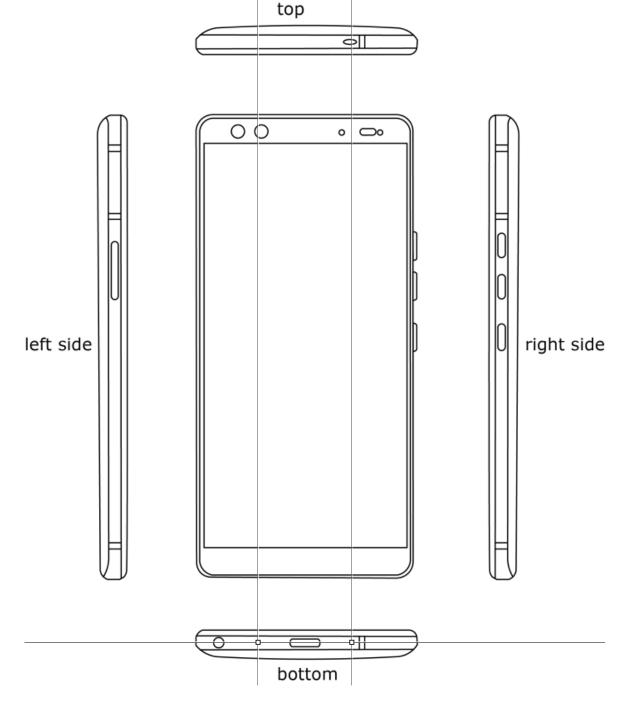
Average

Terrible

Excellent

Good

Q25. Indicate in which area the speakers of your smartphone are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 2 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

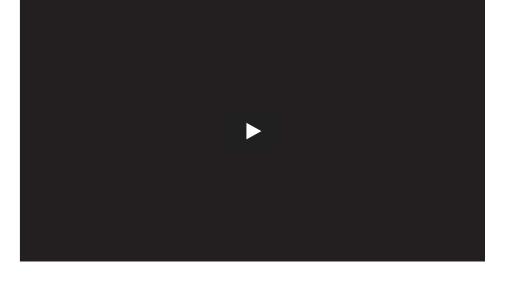


Q26. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
  By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



• Or with by playing the video



	Mono	sound
--	------	-------

- Stereo sound
- The sound changes with the orientation of the device

Q27. Did you take the speakers and sound quality into acount when buying this smartphone?

- Yes
- Maybe / I can't remember
- No

Q62. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the smartphone, external speakers connected to the smartphoneor headphones that are connected to the smartphonevia either bluethooth or cable.

	I would play the audio via the speaker of my smartphone	I would play the audio from headphones connected to my smartphone	I would play the audio from external speakers connected to my smartphone
Watching YouTube	0	•	0
Browsing social media (Facebook, Instragram, etc)	•		
Listening to music		•	
Watching Netflix or online television	•		
(Video) calling	•		

Q63. What is the reason for your choice in setup when watching YouTube?

- I don't want to bother other people
- I don't want other people to bother me
- I can hear the audio better
- The sound quality is better
- Too much hassle to get another speaker or headphone
- The sound quality is good as it is without the need for extra devices
- Other

Q64. What is the reason for your choice in setup when **browsing social media**?

I don't want to bother other people

The sound quality is good as it is without the need for extra devices  Other  Q65. What is the reason for your choice in setup when listening to music?  I don't want to bother other people I don't want other people to bother me I can hear the audio better The sound quality is better Too much hassle to get another speaker or headphone The sound quality is good as it is without the need for extra devices Other  Q66. What is the reason for your choice in setup when watching Netflix or online television I don't want to bother other people I don't want other people to bother me I can hear the audio better The sound quality is better Too much hassle to get another speaker or headphone The sound quality is good as it is without the need for extra devices Other  Q28. After listening to the song on your smartphone, how do you rate the audio quality on a one to five? You can test this with: The stereo test link ( https://www.youtube.com/watch?v=Vt4CEfMTLJc ) By typing the title in the search bar ( Queen - Bohemian Rhapsody (HQ).) By scanning the QR code	
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Q28. After listening to the song on your smartphone, how do you rate the audio quality on a one to five? You can test this with:  • The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )  • By typing the title in the search bar ( <a href="Queen - Bohemian Rhapsody">Queen - Bohemian Rhapsody</a> (HQ))	
<ul> <li>The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )</li> <li>By typing the title in the search bar ( <a href="Queen - Bohemian Rhapsody">Queen - Bohemian Rhapsody</a> (HQ)</li> </ul>	
<ul> <li>The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )</li> <li>By typing the title in the search bar ( <a href="Queen - Bohemian Rhapsody">Queen - Bohemian Rhapsody</a> (HQ)</li> </ul>	
<ul> <li>The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )</li> <li>By typing the title in the search bar ( <a href="Queen - Bohemian Rhapsody">Queen - Bohemian Rhapsody</a> (HQ)</li> </ul>	
<ul> <li>The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )</li> <li>By typing the title in the search bar ( <a href="Queen - Bohemian Rhapsody">Queen - Bohemian Rhapsody</a> (HQ)</li> </ul>	scale from
<ul> <li>By typing the title in the search bar ( Queen - Bohemian Rhapsody (HQ) )</li> </ul>	
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FX80290-200	
Or with by playing the video	

 $\hfill \bigcirc$  I don't want other people to bother me

I can hear the audio betterThe sound quality is better

	Excellent	Good	Average	Poor	Terrible
Audio quality		•			

Q29. Describe <u>positive</u> aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Clean, Synthetic

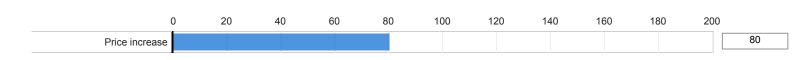
Q30. Describe <u>negative</u> aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Thin

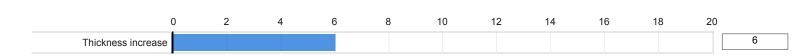
Q31. If you could change anything about the sound performance of your smartphone what would it be? If you would not change anything you can leave this field blank.



Q84. I would pay ... dollar/euro more for a smartphone to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q85. I would be willing to choose a smartphone that is ... milimeter (1 mm is 0.04 inch) thicker than my current smartphone to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker smartphone for a better sound performance set the slider to 0.



Q18. Indicate in which area the speakers of your laptop are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

This question was not displayed to the respondent.

Q19. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



Or with by playing the video



This question was not displayed to the respondent.

Q20. Did you take the speakers and sound quality into acount when buying this laptop?

This question was not displayed to the respondent.

Q67. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the laptop, external speakers connected to the laptop or headphones that are connected to the laptop via either bluethooth or cable.

This question was not displayed to the respondent.

Q68. What is the reason for your choice in setup when watching YouTube?

This question was not displayed to the respondent.

Q69. What is the reason for your choice in setup when browsing social media?

This question was not displayed to the respondent.

Q70. What is the reason for your choice in setup when listening to music?

This question was not displayed to the respondent.

Q71. What is the reason for your choice in setup when watching Netflix or online television?

This question was not displayed to the respondent.

Q21. After listening to the song on your laptop, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
- By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q22. Describe <u>positive</u> aspects about the audio quality of your laptop. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q23. Describe <u>negative</u> aspects about the audio quality of your laptop. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q24. If you could change anything about the sound performance of your laptop what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

Q82. I would pay ... dollar/euro more for a laptop to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q83. I would be willing to choose a laptop that is ... milimeter (1 mm is 0.04 inch) thicker than my current laptop to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker laptop for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q92. Check the boxes that apply for the purchase of your portable speaker

This question was not displayed to the respondent.

This question was not displayed to the respondent.

Q91. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



Or with by playing the video



This question was not displayed to the respondent.

Q98. After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ))
- By scanning the QR code



Or with by playing the video



Q99. Describe <u>positive</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q100. Describe <u>negative</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q101. If you could change anything about the sound performance of your portable speaker what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

Q102. I would pay ... dollar/euro more for a portable speaker to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q103. I would be willing to choose a portable speaker that is ... centimeter (1 cm is 0.4 inch) thicker than my current portable speaker to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker portable speaker for a better sound performance set the slider to 0.

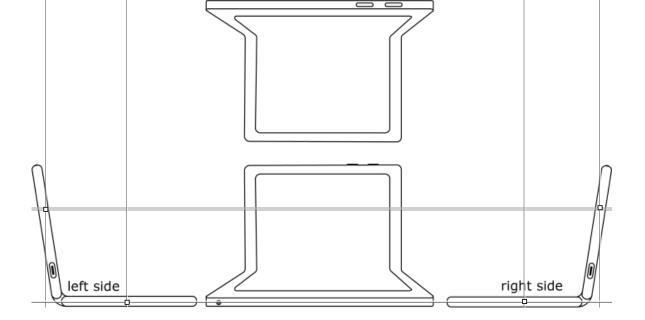
This question was not displayed to the respondent.

### Q28.

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable laptop. This device has the same specifications as a well performing laptop but the screen covers the whole area of the laptop where the keyboard used to be. When the laptop is folded open in the laptop position the top of the screen can be compared to a regular tablet screen with another tablet screen as a keyboard. If the laptop is fully folded open it transforms in a 17 inch screen.



Q10. Where do you expect the speakers are placed in a foldable laptop? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q35. What would you expect from the speakers of the foldable laptop compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

At least the Same Quality as the	At least the Same Quality as the speakers on my Tablet					
	, , , , , , , , , , , , , , , , , , , ,					

Q77. What is the main advantage of a foldable laptop compared to a normal laptop in your eyes?

No idea maybe more compactless weight?

Q36. Would the foldable laptop have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

Q73. What would you expect the audio quality to be of a foldable laptop?

	Excellent	Good	Average	Poor	Terrible
Audio quality	0	•	0	0	0

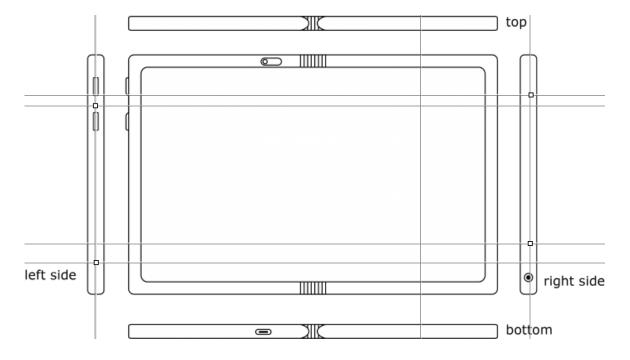
Q37. How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Tablet	1
Foldable laptop	2
Smartphone	3

tablet but the screen can be folded in half to reduce the size. When the tablet is fully folded open the screen is 13 inches, but the tablet can also be used in a small laptop position. Each half is turned into a 9 inch screen, which can be compared to a small tablet.



Q46. Where do you expect the speakers are placed in a foldable tablet? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q47. What would you expect from the speakers of the foldable tablet compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Same quality as my IPad Pro

The ability of changing the seize	e of it when needed to				
48. Would the foldable ta	ablet have a mono	or stereo spea	ker setup?		
Mono					
<ul><li>Stereo</li></ul>					
Mono, but the sound change	es with the orientation o	f the device			
Stereo, but the sound chang	ges with the orientation	of the device			
72. What would you expe	ect the audio qual	ity to be of a fol	dable tablet?		
	Excellent	Good	Average	Poor	Terrible
io quality			$\bigcirc$		
Foldable tablet					1
Foldable tablet					1
Tablet					2
Smartphone					3
51. Lastly we would like to formation anonymous so	it cannot be liked				keep this
Male					
<ul><li>Male</li><li>Female</li></ul>					
<ul><li>Female</li></ul>	3				
<ul><li>Female</li><li>Other</li><li>I do not want to disclose this</li></ul>	<b>;</b>				
<ul><li>Female</li><li>Other</li><li>I do not want to disclose this</li></ul>	3				
<ul> <li>Female</li> <li>Other</li> <li>I do not want to disclose this</li> <li>32. How old are you?</li> </ul>		:y?			
<ul><li>Female</li><li>Other</li><li>I do not want to disclose this</li><li>32. How old are you?</li></ul>		ty?			

Q78. What is the main advantage of a foldable tablet compared to a normal tablet in your eyes?

### Q34. How would you rate your hearing?

	Excellent	Good	Average	Poor	Terrible
Click to write Statement 1		•			

#### Q52. Check the boxes that apply to you

- Before this survey I was already familiar with foldable tablets and laptops
- ✓ I would consider myself up to date on technology trends
- I like to buy the newest personal mobile devices when they are released

Q100. Is there anything you would like to let us know either about the topic of the survey or the survey itself? If not you can submit the survey by clicking on next button.

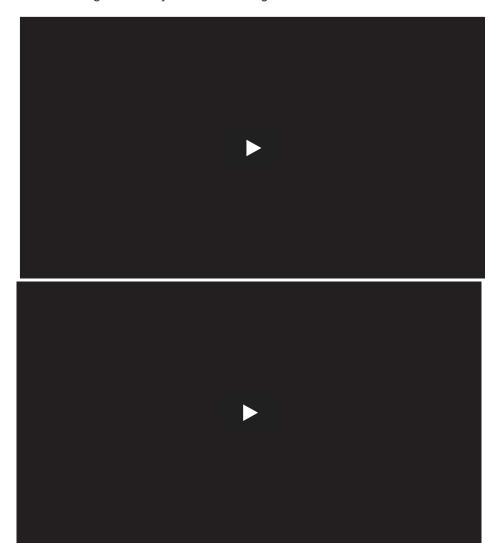
Good Survey! I was a Little Bit confused about the following: In the beginning of the Survey I was asked to State which devices I was using during the Survey. I mentioned that I was using my Tablet and smarthphone. Later on I had to answer questions about the Sound on my portable speaker which I didn't use during the Survey... maybe I did something wrong or misunderstood the question?

Q109. For SurveyCircle users (www.surveycircle.com): The Survey Code is: G3LH-YBVM-Y719-SWNU or click the following link: <a href="https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU">https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU</a>

# 8.10.10 User test results participant 10

*Introduction.* Thank you for participating in this research about expectations for speakers in personal mobile devices. With personal mobile devices we mean either laptops, smarphones or tablets. This research will take approximately **15 to 30 minutes**, based on the amount of devices you participate with.

To participate in this survey we want you to have **access to at least two** (but preferably all) of the following mobile devices: a **tablet**, **laptop**, **portable speaker and/or smartphone**. These devices are needed to watch video's on YouTube on to rate the audio quailty of each seperate device. The video's you will use during this survey are the following:



These video's will also be available for the related questions, but only for the device you take the survey on. For your other devices we recommend you to use the titel of the video to find it on YouTube, scan the QR code or type the following links in your browser:

- https://www.youtube.com/watch?v=Vt4CEfMTLJc " Queen Bohemian Rhapsody (HQ) "
- https://www.youtube.com/watch?v=6TWJaFD6R2s " #Stereo: Left and Right Stereo Sound Test "

It is advised to test the video's on all devices before you continue with the survey and to make sure you are in an area in which you can play the audio at a audible level. The audio should be played through the speakers of the device itself, so not trough headphones or external speakers that are connected to the device.

All the information that is gathered in this survey will be kept confidential and your results are anonymous, non of these results can be linked back to you.

Devices used. State the devices you have access to to use during this research.

•	2 Laptop
	Portable speaker
	olet brand. Which brand and type of tablet do you own? (if you have multiple tablets only state the one will be using during this research)
Th	is question was not displayed to the respondent.
	5. How would you rank your tablet compared to other tablets on the market when you bought the let?
Th	is question was not displayed to the respondent.
Q74	4. In which year did you buy your tablet?
Th	is question was not displayed to the respondent.
Sm only	artphone brand. Which <u>brand</u> and <u>type</u> of smartphone do you own? (if you have multiple smartphones of <u>state the one you will be using</u> during this research)
Ιp	phone SE
	High-end smartphone  Mid-range smartphone
	Low-end smartphone
Q7	5. In which year did you buy your smartphone?
2	017
	otop brand. Which <u>brand</u> and <u>type</u> of laptop do you own? (if you have multiple laptops only <u>state the</u> <u>e you will be using</u> during this research)
Н	
	IP Elitebook 8570w
	IP Elitebook 8570w
	7. How would you rank your laptop compared to other laptops on the market when you bought the top?
•	7. How would you rank your laptop compared to other laptops on the market when you bought the
	7. How would you rank your laptop compared to other laptops on the market when you bought the top?
	7. How would you rank your laptop compared to other laptops on the market when you bought the top?  High-end laptop
Q76	7. How would you rank your laptop compared to other laptops on the market when you bought the top?  High-end laptop  Mid-range laptop
	7. How would you rank your laptop compared to other laptops on the market when you bought the top?  High-end laptop  Mid-range laptop  Low-end laptop

✓ Smartphone

Q102. Which brand and type of portable speaker do you own? (if you have portable speakers only state the one you will be using during this research)

This question was not displayed to the respondent.

Q103. How would you rank your portable speaker compared to other portable speakers on the market when you bought the portable speaker?

This question was not displayed to the respondent.

Q104. In which year did you buy your portable speaker?

This question was not displayed to the respondent.

Speaker position. Indicate in which area the speakers of your tablet are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

This question was not displayed to the respondent.

Q9. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar (#Stereo: Left and Right Stereo Sound Test)
- · By scanning the QR code



Or with by playing the video

This question was not displayed to the respondent.

Q13. Did you take the speakers and sound quality into acount when buying your tablet?

This question was not displayed to the respondent.

Q38. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the tablet, external speakers connected to the tablet or headphones that are connected to the tablet via either bluethooth or cable.

Q61. What is the reason for your choice in setup when watching YouTube?

This question was not displayed to the respondent.

Q58. What is the reason for your choice in setup when browsing social media?

This question was not displayed to the respondent.

Q59. What is the reason for your choice in setup when listening to music?

This question was not displayed to the respondent.

Q60. What is the reason for your choice in setup when watching Netflix or online television?

This question was not displayed to the respondent.

Q14. After listening to the song on your tablet, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
- · By scanning the QR code



Or with by playing the video



This question was not displayed to the respondent.

Q15. Describe <u>positive aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

*Q16.* Describe <u>negative aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Q17. If you could change anything about the sound performance of your tablet what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

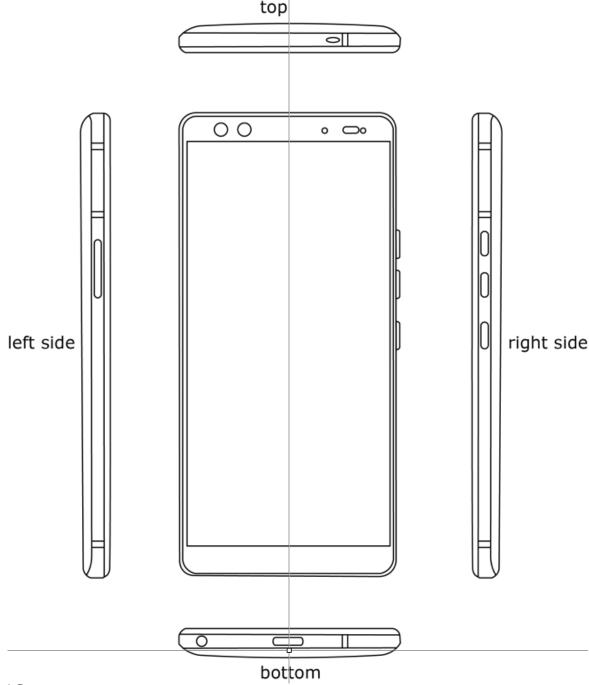
Q79. I would pay ... dollar/euro more for a tablet to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q80. I would be willing to choose a tablet that is ... milimeter (1 mm is 0.04 inch) thicker than my current tablet to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker tablet for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q25. Indicate in which area the speakers of your smartphone are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 2 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q26. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



Or with by playing the video



- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q27. Did you take the speakers and sound quality into acount when buying this smartphone?

- Yes
- Maybe / I can't remember
- No

Q62. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the smartphone, external speakers connected to the smartphoneor headphones that are connected to the smartphonevia either bluethooth or cable.

	I would play the audio via the speaker of my smartphone	I would play the audio from headphones connected to my smartphone	I would play the audio from external speakers connected to my smartphone
Watching YouTube	•	0	0
Browsing social media (Facebook, Instragram, etc)	•		
Listening to music			
Watching Netflix or online television	•		
(Video) calling	•		

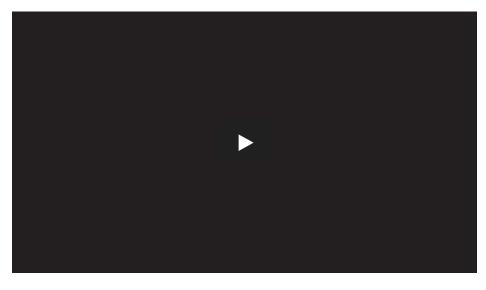
Q63. What is the reason for your choice in setup when watching YouTube?

- I don't want to bother other people
- I don't want other people to bother me

	Too much hassle to get another speaker or headphone
$\bigcirc$	The sound quality is good as it is without the need for extra devices
	Other
Q64.	What is the reason for your choice in setup when <b>browsing social media</b> ?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q65.	What is the reason for your choice in setup when <u>listening to music</u> ?
	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q66.	What is the reason for your choice in setup when watching Netflix or online television?
$\bigcirc$	I don't want to bother other people
$\bigcirc$	I don't want other people to bother me
$\bigcirc$	I can hear the audio better
	The sound quality is better
$\bigcirc$	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q28.	After listening to the song on your smartphone, how do you rate the audio quality on a scale from
	o five? You can test this with:
	The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )  By typing the title in the search bar ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">Queen - Bohemian Rhapsody (HQ)</a> )
	By scanning the QR code
	■数据 <b>同</b>

• Or with by playing the video

I can hear the audio betterThe sound quality is better



	Excellent	Good	Average	Poor	Terrible
Audio quality	0	0	•	0	0

Q29. Describe **positive** aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

clear	r			

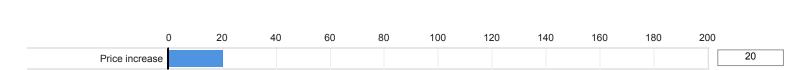
Q30. Describe <u>negative</u> aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

thin dull distorted harsh		

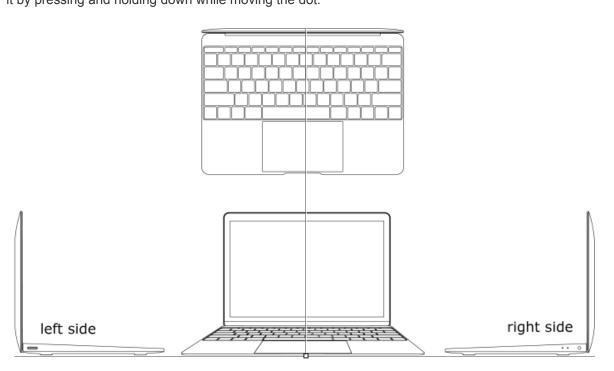
Q31. If you could change anything about the sound performance of your smartphone what would it be? If you would not change anything you can leave this field blank.



Q84. I would pay ... dollar/euro more for a smartphone to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



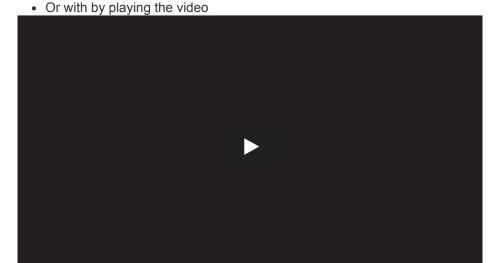
Q85. I would be willing to choose a smartphone that is ... millimeter (1 mm is 0.04 inch) thicker than my current smartphone to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker smartphone for a better sound performance set the slider to 0.



Q19. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code





- Mono sound
- Stereo sound

Maybe / I can't remembe	r		
<ul><li>No</li></ul>			
	enario which case is most com ween internal speakers of the		
	nnected to the laptop via eithe		sormeoted to the laptop of
	I		
	I would play the audio via the speaker of my laptop	I would play the audio from headphones connected to my laptop	I would play the audio from external speakers connected to my laptop
Natching YouTube	•	0	0
Browsing social media Facebook, Instragram, etc)	•		0
Listening to music	•		0
Watching Netflix or online	•		0
elevision (Video) calling	•	0	$\circ$
vidoo, calling			
000 \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	. Consideration to a consideration	· · · · · · · · · · · · · · · · · · ·	
Qoo. what is the reason	n for your choice in setup wher	watching YouTube?	
<ul> <li>I don't want to bother oth</li> </ul>	er people		
I don't want other people			
I can hear the audio better	er		
<ul> <li>The sound quality is better</li> </ul>	er		
<ul> <li>Too much hassle to get a</li> </ul>	nother speaker or headphone		
The sound quality is good	d as it is without the need for extra device	es	
Other			
Q69. What is the reason	n for your choice in setup wher	browsing social media?	
I don't want to bother oth			
I don't want other people			
I can hear the audio better			
The sound quality is better			
	nother speaker or headphone		
	d as it is without the need for extra devic	es	
Other			
Q70. What is the reason	n for your choice in setup wher	listening to music?	
I don't want to bother oth			
I don't want other people			
I can hear the audio bette			
The sound quality is better			
	nother speaker or headphone		
	d as it is without the need for extra devic	es	
Other	1		

Q20. Did you take the speakers and sound quality into acount when buying this laptop?

Yes

I don't want other people to	bother me				
I can hear the audio better					
The sound quality is better					
Too much hassle to get ano	ther speaker or headph	one			
The sound quality is good a	s it is without the need f	or extra devices			
Other					
Q21. After listening to the five? You can test this with  The stereo test link ( By typing the title in t  By scanning the QR	n: <u>https://www.youtu</u> the search bar ( <u>Q</u>	be.com/watch?	v=Vt4CEfMTLJc	)	from one to
<ul> <li>Or with by playing the</li> </ul>	e video	EE-18-10-			
	Excellent	Good	Average	Poor	Terrible
audio quality	0	•	0	0	0
Q22. Describe positive as this field blank. As an exar		words such as:	Clean, Full, Stro	ng, Clear, Spac	ious, Deep,
	synthetic				
Distorted.	synthetic				

Q71. What is the reason for your choice in setup when watching Netflix or online television?

I don't want to bother other people

352

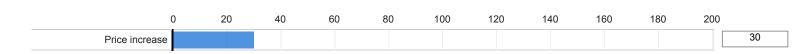
Distorted.

fuzzy, distorted dull

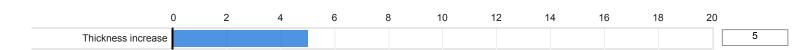
Q24. If you could change anything about the sound performance of your laptop what would it be? If you would not change anything you can leave this field blank.

More brightness		

Q82. I would pay ... dollar/euro more for a laptop to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q83. I would be willing to choose a laptop that is ... milimeter (1 mm is 0.04 inch) thicker than my current laptop to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker laptop for a better sound performance set the slider to 0.



Q92. Check the boxes that apply for the purchase of your portable speaker

This question was not displayed to the respondent.

Q97. In which scenario's do you use your portable speaker?

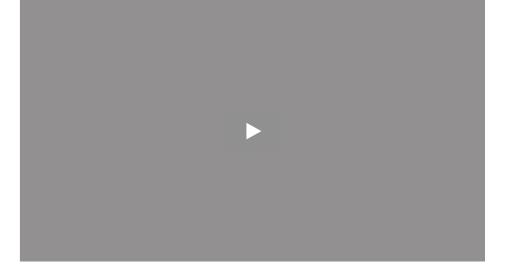
This question was not displayed to the respondent.

Q91. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



· Or with by playing the video



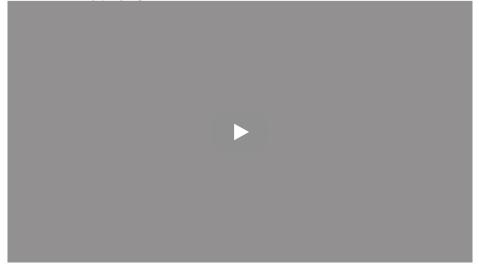
This question was not displayed to the respondent.

Q98. After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
- By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q99. Describe **positive** aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q100. Describe <u>negative</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Q101. If you could change anything about the sound performance of your portable speaker what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

Q102. I would pay ... dollar/euro more for a portable speaker to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q103. I would be willing to choose a portable speaker that is ... centimeter (1 cm is 0.4 inch) thicker than my current portable speaker to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker portable speaker for a better sound performance set the slider to 0.

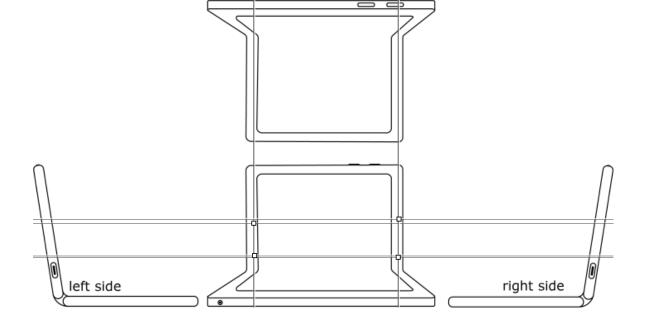
This question was not displayed to the respondent.

#### Q28.

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable laptop. This device has the same specifications as a well performing laptop but the screen covers the whole area of the laptop where the keyboard used to be. When the laptop is folded open in the laptop position the top of the screen can be compared to a regular tablet screen with another tablet screen as a keyboard. If the laptop is fully folded open it transforms in a 17 inch screen.



Q10. Where do you expect the speakers are placed in a foldable laptop? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q35. What would you expect from the speakers of the foldable laptop compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

	4 side speakers in front with a separate bass (at base)
Q	77. What is the main advantage of a foldable laptop compared to a normal laptop in your eyes?
	larger screen possible

Q36. Would the foldable laptop have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

Q73. What would you expect the audio quality to be of a foldable laptop?

	Excellent	Good	Average	Poor	Terrible
Audio quality	•		0		

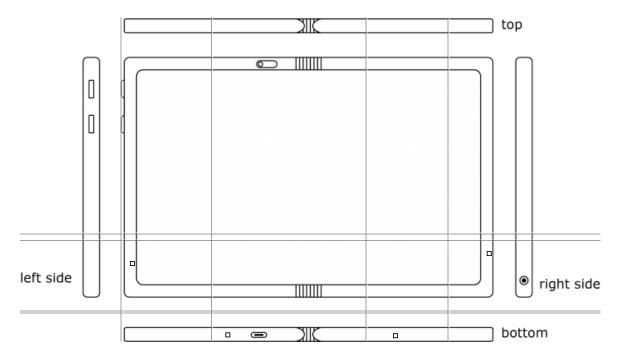
Q37. How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Foldable laptop	
Smartphone	
Laptop	

tablet but the screen can be folded in half to reduce the size. When the tablet is fully folded open the screen is 13 inches, but the tablet can also be used in a small laptop position. Each half is turned into a 9 inch screen, which can be compared to a small tablet.



Q46. Where do you expect the speakers are placed in a foldable tablet? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q47. What would you expect from the speakers of the foldable tablet compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

2008. How would you rank the foldable tablet compared to your devices, based on your expectations about the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst speakers.  Laptop  Foldable tablet  2 Smartphone  3  251. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.  231. What would you state is your gender?  Male  Female  Other  I do not want to disclose this		larger scree				
Mono. Stereo Mono, but the sound changes with the orientation of the device Stereo, but the sound changes with the orientation of the device Stereo, but the sound changes with the orientation of the device 272. What would you expect the audio quality to be of a foldable tablet? Excellent Good Average Poor Terrible undio quality ■ Poor Terrible 2708. How would you rank the foldable tablet compared to your devices, based on your expectations about the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst speakers. Laptop						
Stereo Mono, but the sound changes with the orientation of the device Stereo, but the sound changes with the orientation of the device  Termine  Excellent Good Average Poor Termine Idio quality  Excellent Good Average Poor Termine Idio quality  Page 1208. How would you rank the foldable tablet compared to your devices, based on your expectations about the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst peakers.  Laptop Foldable tablet Smartphone  251. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.  231. What would you state is your gender?  Male Female Other 1 do not want to disclose this  232. How old are you?	Q48. Would the foldable ta	ablet have a mono	or stereo spea	ker setup?		
Mono, but the sound changes with the orientation of the device    Stereo, but the sound changes with the orientation of the device   Stereo, but the sound changes with the orientation of the device   Q72. What would you expect the audio quality to be of a foldable tablet?   Excellent	Mono					
Stereo, but the sound changes with the orientation of the device  272. What would you expect the audio quality to be of a foldable tablet?    Excellent   Good   Average   Poor   Terrible	Stereo					
272. What would you expect the audio quality to be of a foldable tablet?    Excellent   Good   Average   Poor   Terrible	<ul> <li>Mono, but the sound change</li> </ul>	es with the orientation o	f the device			
Excellent Good Average Poor Temble and oquality  Q108. How would you rank the foldable tablet compared to your devices, based on your expectations about the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst speakers.  Laptop  Laptop  Poidable tablet  2  Smartphone  3  Q51. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.  Q31. What would you state is your gender?  Male  Pemale  Other  I do not want to disclose this  Q32. How old are you?	<ul> <li>Stereo, but the sound chang</li> </ul>	ges with the orientation	of the device			
Q108. How would you rank the foldable tablet compared to your devices, based on your expectations about the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst speakers.  Laptop  Foldable tablet  Smartphone  Q51. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.  Q31. What would you state is your gender?  Male  Female  Other  I do not want to disclose this  Q32. How old are you?	Q72. What would you expe	ect the audio qual	ity to be of a fol	dable tablet?		
2708. How would you rank the foldable tablet compared to your devices, based on your expectations about the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst speakers.  Laptop  1 Foldable tablet  2 Smartphone  3  251. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.  231. What would you state is your gender?  Male  Female  Other  I do not want to disclose this  232. How old are you?		Excellent	Good	Average	Poor	Terrible
Laptop  Foldable tablet  Smartphone  Q51. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.  Q31. What would you state is your gender?  Male  Female  Other  I do not want to disclose this  Q32. How old are you?	audio quality	0	•	$\circ$		
Smartphone  Q51. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.  Q31. What would you state is your gender?  Male Female Other I do not want to disclose this  Q32. How old are you?	Laptop					1
Smartphone  Q51. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.  Q31. What would you state is your gender?  Male Female Other I do not want to disclose this  Q32. How old are you?	Laptop					1
Q51. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.  Q31. What would you state is your gender?  Male Female Other I do not want to disclose this  Q32. How old are you?  26	Foldable tablet					2
nformation anonymous so it cannot be liked to you as stated in the introduction.  Q31. What would you state is your gender?  Male Female Other I do not want to disclose this  Q32. How old are you?  26  Q33. What would you state is your nationality?	Smartphone					3
Other I do not want to disclose this  Q32. How old are you?  26  Q33. What would you state is your nationality?						
O I do not want to disclose this  Q32. How old are you?  26  Q33. What would you state is your nationality?	nformation anonymous so	it cannot be liked				eep this
Q32. How old are you?  26  Q33. What would you state is your nationality?	nformation anonymous so  Q31. What would you state  Male	it cannot be liked				eep this
Q33. What would you state is your nationality?	nformation anonymous so  Q31. What would you state  Male Female Other	e is your gender?				eep this
Q33. What would you state is your nationality?	nformation anonymous so  Q31. What would you state  Male Female Other	e is your gender?				eep this
	nformation anonymous so  Q31. What would you state  Male Female Other	e is your gender?				eep this
Netherlands	nformation anonymous so  Q31. What would you state  Male Female Other I do not want to disclose this  Q32. How old are you?	e is your gender?				eep this
	nformation anonymous so  Q31. What would you state  Male Female Other I do not want to disclose this  Q32. How old are you?	e is your gender?	to you as state			eep this

Q78. What is the main advantage of a foldable tablet compared to a normal tablet in your eyes?

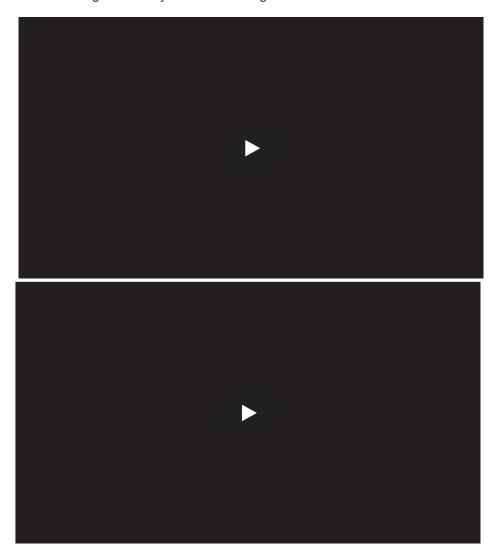
	Excellent	Good	Average	Poor	Terrible
Click to write Statement 1	0	0	•	0	0
Q52. Check the boxes that	apply to you				
☐ Before this survey I was alread	ady familiar with foldab	le tablets and laptop	s		
I would consider myself up to	date on technology tre	ends			
☐ I like to buy the newest person	onal mobile devices wh	en they are released	d		
Q100. Is there anything you				of the survey or	the survey
itself? If not you can submi	t the survey by ci	icking on next t	outton.		

Q109. For SurveyCircle users (www.surveycircle.com): The Survey Code is: G3LH-YBVM-Y719-SWNU or click the following link:  $\frac{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}$ 

# 8.10.11 User test results participant 11

Introduction. Thank you for participating in this research about expectations for speakers in personal mobile devices. With personal mobile devices we mean either laptops, smarphones or tablets. This research will take approximately **15 to 30 minutes**, based on the amount of devices you participate with.

To participate in this survey we want you to have **access to at least two** (but preferably all) of the following mobile devices: a **tablet**, **laptop**, **portable speaker and/or smartphone**. These devices are needed to watch video's on YouTube on to rate the audio quailty of each seperate device. The video's you will use during this survey are the following:



These video's will also be available for the related questions, but only for the device you take the survey on. For your other devices we recommend you to use the titel of the video to find it on YouTube, scan the QR code or type the following links in your browser:

- https://www.youtube.com/watch?v=Vt4CEfMTLJc " Queen Bohemian Rhapsody (HQ) "
- https://www.youtube.com/watch?v=6TWJaFD6R2s " #Stereo: Left and Right Stereo Sound Test "

It is advised to test the video's on all devices before you continue with the survey and to make sure you are in an area in which you can play the audio at a audible level. The audio should be played through the speakers of the device itself, so not trough headphones or external speakers that are connected to the device.

All the information that is gathered in this survey will be kept confidential and your results are anonymous, non of these results can be linked back to you.

Devices used. State the devices you have access to to use during this research.

✓ Portable speaker
Tablet brand. Which brand and type of tablet do you own? (if you have multiple tablets only state the one you will be using during this research)
This question was not displayed to the respondent.
Q55. How would you rank your tablet compared to other tablets on the market when you bought the tablet?
This question was not displayed to the respondent.
Q74. In which year did you buy your tablet?
This question was not displayed to the respondent.
Smartphone brand. Which <u>brand</u> and <u>type</u> of smartphone do you own? (if you have multiple smartphones only <u>state the one you will be using</u> during this research)
iPhone 6S
<ul> <li>bought the smartphone?</li> <li>High-end smartphone</li> <li>Mid-range smartphone</li> <li>Low-end smartphone</li> </ul>
Q75. In which year did you buy your smartphone?
2014
Laptop brand. Which <u>brand</u> and <u>type</u> of laptop do you own? (if you have multiple laptops only <u>state the</u> <u>one you will be using</u> during this research)
MacBook Pro 15" (end of 2019 model)
Q57. How would you rank your laptop compared to other laptops on the market when you bought the laptop?
High-end laptop
Mid-range laptop
Low-end laptop
Q76. In which year did you buy your laptop?
2019

SmartphoneLaptop

Q102. Which <u>brand</u> and <u>type</u> of portable speaker do you own? (if you have portable speakers only <u>state</u> <u>the one you will be using</u> during this research)

HifiBerry Amp+ on top of a Raspberry Pi 3 with 2 big speakers (sorry not very portable, not sure if you can use these results).

Q103. How would you rank your portable speaker compared to other portable speakers on the market when you bought the portable speaker?

- High-end portable speaker
- Mid-range portable speaker
- Low-end portable speaker

Q104. In which year did you buy your portable speaker?

2016			

Speaker position. Indicate in which area the speakers of your tablet are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

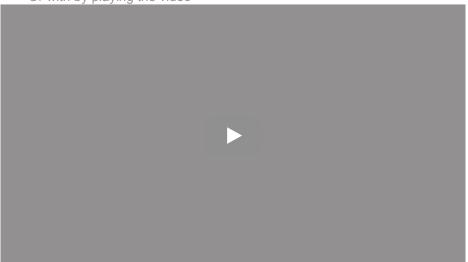
This question was not displayed to the respondent.

Q9. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q13. Did you take the speakers and sound quality into acount when buying your tablet?

Q38. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the tablet, external speakers connected to the tablet or headphones that are connected to the tablet via either bluethooth or cable.

This question was not displayed to the respondent.

Q61. What is the reason for your choice in setup when watching YouTube?

This question was not displayed to the respondent.

Q58. What is the reason for your choice in setup when browsing social media?

This question was not displayed to the respondent.

Q59. What is the reason for your choice in setup when listening to music?

This question was not displayed to the respondent.

Q60. What is the reason for your choice in setup when watching Netflix or online television?

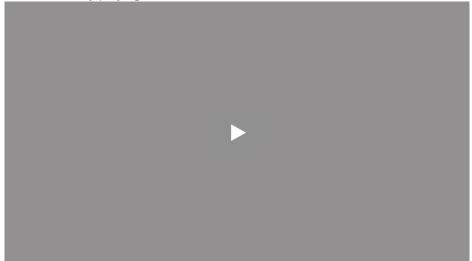
This question was not displayed to the respondent.

Q14. After listening to the song on your tablet, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <u>https://www.youtube.com/watch?v=Vt4CEfMTLJc</u> )
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ))
- By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q15. Describe <u>positive aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

*Q16.* Describe <u>negative aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q17. If you could change anything about the sound performance of your tablet what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

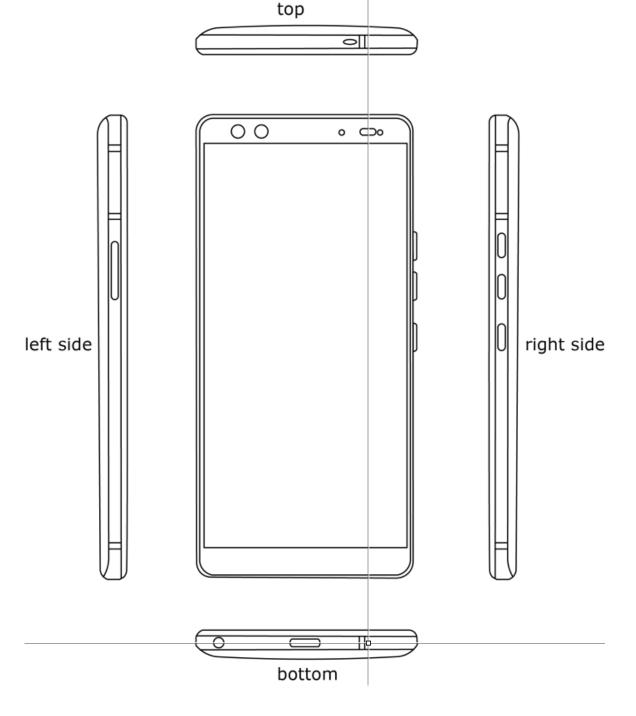
Q79. I would pay ... dollar/euro more for a tablet to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q80. I would be willing to choose a tablet that is ... milimeter (1 mm is 0.04 inch) thicker than my current tablet to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker tablet for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q25. Indicate in which area the speakers of your smartphone are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 2 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

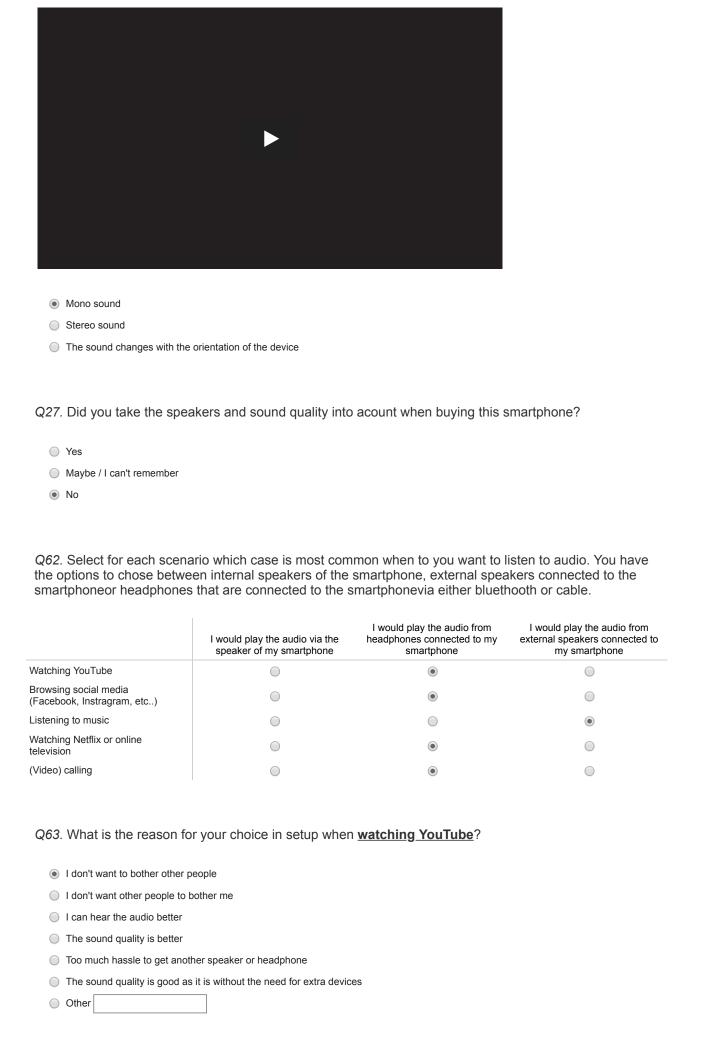


Q26. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
  By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



· Or with by playing the video



Q64. What is the reason for your choice in setup when **browsing social media**?

	The sound quality is better			
	Too much hassle to get another speaker or headphone			
	The sound quality is good as it is without the need for extra devices			
0	Other			
Q65.	. What is the reason for your choice in setup when <u>listening to music</u> ?			
	I don't want to bother other people			
	I don't want other people to bother me			
	I can hear the audio better			
•	The sound quality is better			
	Too much hassle to get another speaker or headphone			
	The sound quality is good as it is without the need for extra devices			
	Other			
Q66.	. What is the reason for your choice in setup when watching Netflix or online television?			
$\bigcirc$	I don't want to bother other people			
	I don't want other people to bother me			
$\bigcirc$	I can hear the audio better			
$\bigcirc$	The sound quality is better			
	Too much hassle to get another speaker or headphone			
	The sound quality is good as it is without the need for extra devices			
•	Other I don't watch netflix or online tv on my phone			
one t	. After listening to the song on your smartphone, how do you rate the audio quality on a scale fro to five? You can test this with:  The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )			

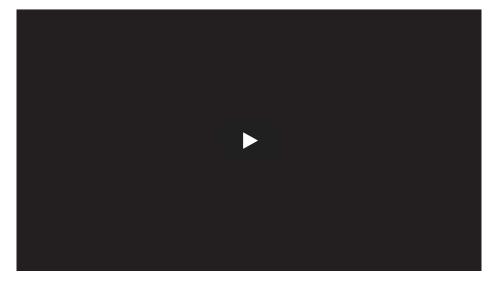
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
   By scanning the QR code

O I don't want other people to bother me

O I can hear the audio better



• Or with by playing the video



	Excellent	Good	Average	Poor	Terrible
Audio quality	0	0	0	•	0

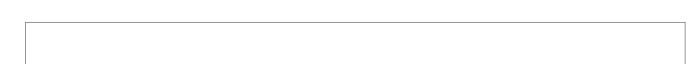
Q29. Describe **positive** aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Complete, Clean

Q30. Describe <u>negative</u> aspects about the audio quality of your smartphone. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Thin

Q31. If you could change anything about the sound performance of your smartphone what would it be? If you would not change anything you can leave this field blank.

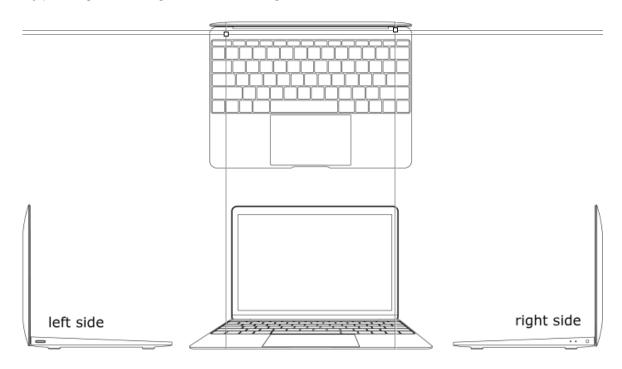


Q84. I would pay ... dollar/euro more for a smartphone to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q85. I would be willing to choose a smartphone that is ... milimeter (1 mm is 0.04 inch) thicker than my current smartphone to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker smartphone for a better sound performance set the slider to 0.

Q18. Indicate in which area the speakers of your laptop are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

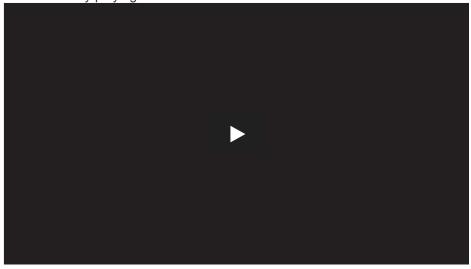


Q19. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- · By scanning the QR code



· Or with by playing the video



- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Maybe / I can't remember			
No			
• NO			
067 Select for each scena	ario which case is most com	mon when to you want to li	isten to audio. Vou have
	en internal speakers of the		
headphones that are conne	ected to the laptop via eithe	r bluethooth or cable.	
	I	located alocation and forces	Lorentel along the another forces
	I would play the audio via the	I would play the audio from headphones connected to my	I would play the audio from external speakers connected to
Matahina VauTuha	speaker of my laptop	laptop	my laptop
Natching YouTube  Browsing social media	0	•	0
Facebook, Instragram, etc)	0		0
Listening to music	0		•
Natching Netflix or online elevision	0		0
Video) calling	•		
Q68 What is the reason for	or your choice in setup when	watching YouTube?	
	у сан столос и солор и п	<u></u> -	
<ul><li>I don't want to bother other p</li></ul>	people		
I don't want other people to I	bother me		
I can hear the audio better			
The sound quality is better			
Too much hassle to get anot	her speaker or headphone		
<ul> <li>The sound quality is good as</li> </ul>	s it is without the need for extra devic	es	
Other			
O69 What is the reason fo	or your choice in setup when	hrowsing social media?	
QUS. WHAT IS THE TEASON TO	ir your choice in setup when	browsing social incula:	
<ul><li>I don't want to bother other p</li></ul>	people		
<ul> <li>I don't want other people to I</li> </ul>			
I can hear the audio better			
The sound quality is better			
Too much hassle to get anot	her speaker or headphone		
	s it is without the need for extra devic	es	
Other			
Other			
Q/U. What is the reason fo	or your choice in setup when	i <u>listening to music?</u>	
O I don't want to bether attern	anonia.		
I don't want to bother other p			
I don't want other people to b	oother me		
I can hear the audio better			
The sound quality is better			
Too much hassle to get anot			
The sound quality is good as	s it is without the need for extra devic	es	
Other			

Q20. Did you take the speakers and sound quality into acount when buying this laptop?

	oother me				
<ul> <li>I can hear the audio better</li> </ul>					
The sound quality is better					
Too much hassle to get anot	her speaker or headpho	one			
<ul> <li>The sound quality is good as</li> </ul>	it is without the need for	or extra devices			
Other					
<ul> <li>Q21. After listening to the size? You can test this with</li> <li>The stereo test link (!</li> <li>By typing the title in the</li> <li>By scanning the QR of</li> <li>Or with by playing the</li> </ul>	: https://www.youtu ne search bar ( Qu code	be.com/watch?	v=Vt4CEfMTLJc	)	from one to
	•				
udio quality	Excellent	Good	Average	Poor	Terrible
idio quality					

Q71. What is the reason for your choice in setup when watching Netflix or online television?

O I don't want to bother other people

Thin

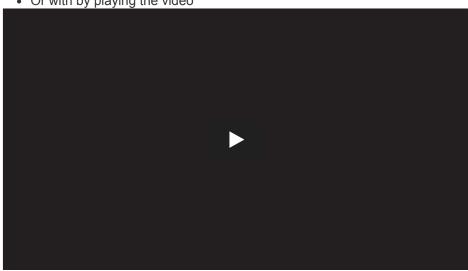
Q24. If you could change a would not change anything	anything a	bout the sou leave this fie	nd perfor ld blank.	mance of	your lapto	op what v	vould it be	e? If you		
Q82. I would pay dollar/ amount. If you would not v								le. Adjust	the slide	r to the right
	0 20	) 40	60	80	100	120	140	160	180	200
Price increase										
Q83. I would be willing to opreviously stated changes better sound performance	possible.	Adjust the sl	milime ider to the	ter (1 mm e right inc	n is 0.04 ir rease in t	nch) thick hickness.	er than m If you wo	ny current ould not w	laptop to ant a thic	make the cker laptop fo
	0 2	4	6	8	10	12	14	16	18	20
<ul> <li>✓ Sound quality</li> <li>✓ Size</li> <li>Price</li> <li>Design</li> <li>Build in light feature</li> <li>Bluethooth</li> <li>Connect multiple speakers t</li> <li>Charge phone with portable</li> <li>✓ Other Airplay</li> <li>None of the above</li> </ul>										
Q97. In which scenario's d	lo you use	your portab	le speake	r?						
Play music at a party										
Play music in a park/garden										
✓ Play music in everyday use □ Play audio of movie or telev										
<ul><li>Play audio of movie or telev</li><li>Use during (video) calls</li></ul>	13011									
<ul><li>Sound during presentations</li></ul>	or meetings									
As sound improvement during										
As sound improvement during										
✓ As sound improvement during the sound i		e use								
Other										
None of the above										

Q91. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



• Or with by playing the video



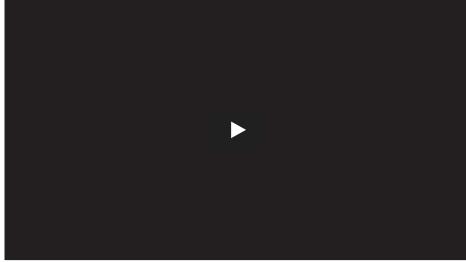
- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q98. After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ) )
- · By scanning the QR code



· Or with by playing the video



		Good	Average	Poor	Terrible
audio quality	•	0	0	0	0

Q99. Describe **positive** aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

Full, Strong, De	еер		

Q100. Describe <u>negative</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.



Q101. If you could change anything about the sound performance of your portable speaker what would it be? If you would not change anything you can leave this field blank.

I would say I have to change my room - I play them in a very small room 3x2 m, which is too small to achieve really good audio quality.

Q102. I would pay ... dollar/euro more for a portable speaker to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q103. I would be willing to choose a portable speaker that is ... centimeter (1 cm is 0.4 inch) thicker than my current portable speaker to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker portable speaker for a better sound performance set the slider to 0.

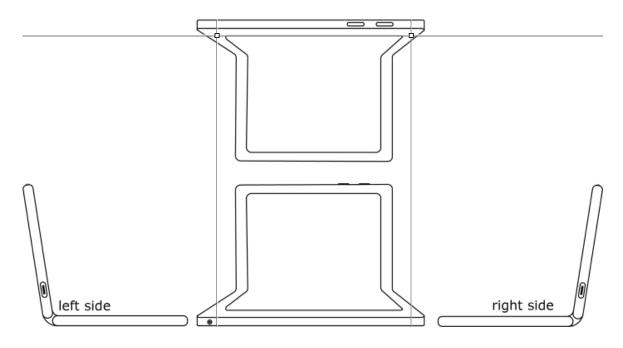


#### Q28.

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable laptop. This device has the same specifications as a well performing laptop but the screen covers the whole area of the laptop where the keyboard used to be. When the laptop is folded open in the laptop position the top of the screen can be compared to a regular tablet screen with another tablet screen as a keyboard. If the laptop is fully folded open it transforms in a 17 inch screen.



Q10. Where do you expect the speakers are placed in a foldable laptop? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q35. What would you expect from the speakers of the foldable laptop compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

I would say they will be similar to my phone or maybe even laptop				

Q77. What is the main advantage of a foldable laptop compared to a normal laptop in your eyes?

More screen			

Q36. Would the foldable laptop have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

	Excellent	Good	Average	Poor	Terrible
Audio quality			•		

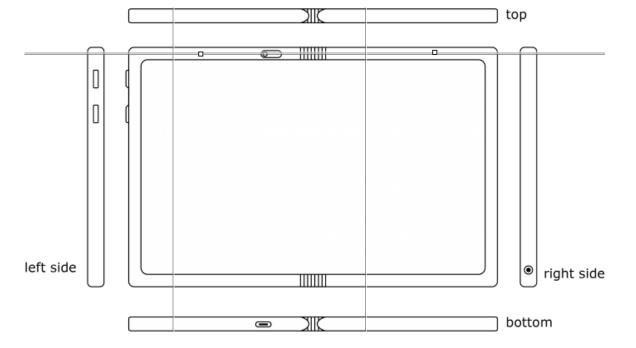
Q37. How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Portable speaker	1
Laptop	2
Foldable laptop	3
Smartphone	4

Q45. In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable tablet. This device has the same specifications as a well performing tablet but the screen can be folded in half to reduce the size. When the tablet is fully folded open the screen is 13 inches, but the tablet can also be used in a small laptop position. Each half is turned into a 9 inch screen, which can be compared to a small tablet.



Q46. Where do you expect the speakers are placed in a foldable tablet? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q47. What would you expect from the speakers of the foldable tablet compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Similar to phone (or maybe even laptop?)

Q78. What is the main advantage of a foldable tablet compared to a normal tablet in your eyes?

More screen

Q48. Would the foldable tablet have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

Q72. What would you expect the audio quality to be of a foldable tablet?

	Excellent	Good	Average	Poor	Terrible
Audio quality	0		•	0	0

Q108. How would you rank the foldable tablet compared to your devices, based on your expectations about the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Portable speaker	1
Laptop	2
Foldable tablet	3
Smartphone	4

231. What would you stat	e is your gender?				
<ul><li>Male</li></ul>					
Female					
Other					
I do not want to disclose this	s				
Q32. How old are you?					
56					
Q33. What would you stat	e is your nationalit	ty?			
Netherlands					
Q34. How would you rate	your hearing?				
Q34. How would you rate	your hearing?  Excellent	Good	Average	Poor	Terrible
	-	Good	Average	Poor	Terrible
ck to write Statement 1	Excellent				
ck to write Statement 1	Excellent  t apply to you	•	0		
ck to write Statement 1  Q52. Check the boxes tha	Excellent  t apply to you  eady familiar with foldab	tablets and laptop	0		
ick to write Statement 1  Q52. Check the boxes that  Before this survey I was alre	Excellent  t apply to you  eady familiar with foldab to date on technology tre	ele tablets and laptopends	S		
Dick to write Statement 1  Q52. Check the boxes that  Before this survey I was alrow  I would consider myself up to buy the newest personal state of the state of	Excellent  t apply to you  eady familiar with foldab to date on technology tre sonal mobile devices wh	Ile tablets and laptopends en they are released tus know either	s about the topic of		
ick to write Statement 1  Q52. Check the boxes that  Before this survey I was alrow I would consider myself up	Excellent  t apply to you  eady familiar with foldab to date on technology tre sonal mobile devices when bu would like to let hit the survey by cli	Ile tablets and laptopends In they are released to the second to the se	s about the topic coutton.	of the survey or	the survey
ick to write Statement 1  Q52. Check the boxes that Before this survey I was alrow I would consider myself up I like to buy the newest pers  Q100. Is there anything your study! I mise	Excellent  t apply to you  eady familiar with foldab to date on technology tre sonal mobile devices when bu would like to let hit the survey by cli	Ile tablets and laptopends In they are released to the second to the se	s about the topic coutton.	of the survey or	the survey

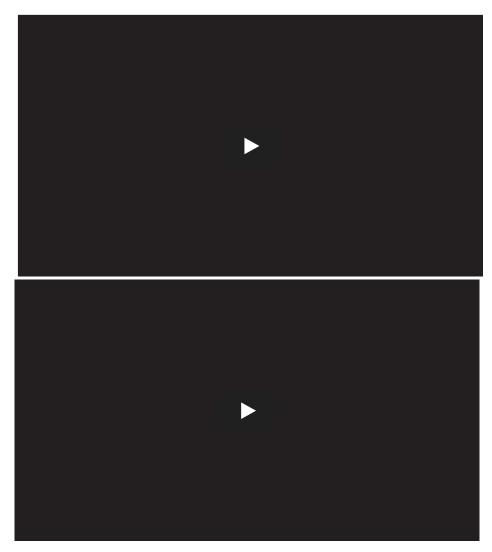
Q51. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.

Q109. For SurveyCircle users (www.surveycircle.com): The Survey Code is: G3LH-YBVM-Y719-SWNU or click the following link: <a href="https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU">https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU</a>

### 8.10.12 User test results participant 12

*Introduction.* Thank you for participating in this research about expectations for speakers in personal mobile devices. With personal mobile devices we mean either laptops, smarphones or tablets. This research will take approximately **15 to 30 minutes**, based on the amount of devices you participate with.

To participate in this survey we want you to have **access to at least two** (but preferably all) of the following mobile devices: a **tablet**, **laptop**, **portable speaker and/or smartphone**. These devices are needed to watch video's on YouTube on to rate the audio quailty of each seperate device. The video's you will use during this survey are the following:



These video's will also be available for the related questions, but only for the device you take the survey on. For your other devices we recommend you to use the titel of the video to find it on YouTube, scan the QR code or type the following links in your browser:

- https://www.youtube.com/watch?v=Vt4CEfMTLJc " Queen Bohemian Rhapsody (HQ) "
- https://www.youtube.com/watch?v=6TWJaFD6R2s "#Stereo: Left and Right Stereo Sound Test"

It is advised to test the video's on all devices before you continue with the survey and to make sure you are in an area in which you can play the audio at a audible level. The audio should be played through the speakers of the device itself, so not trough headphones or external speakers that are connected to the device.

All the information that is gathered in this survey will be kept confidential and your results are anonymous, non of these results can be linked back to you.

Devices used. State the devices you have access to to use during this research.

✓ Portable speaker
Tablet brand. Which brand and type of tablet do you own? (if you have multiple tablets only state the one you will be using during this research)
This question was not displayed to the respondent.
Q55. How would you rank your tablet compared to other tablets on the market when you bought the tablet?
This question was not displayed to the respondent.
Q74. In which year did you buy your tablet?
This question was not displayed to the respondent.
Smartphone brand. Which <u>brand</u> and <u>type</u> of smartphone do you own? (if you have multiple smartphones only <u>state the one you will be using</u> during this research)
Samsung S9
Q56. How would you rank your smartphone compared to other smartphones on the market when you bought the smartphone? <ul> <li>High-end smartphone</li> <li>Mid-range smartphone</li> <li>Low-end smartphone</li> </ul>
Q75. In which year did you buy your smartphone?
2019
Laptop brand. Which <u>brand</u> and <u>type</u> of laptop do you own? (if you have multiple laptops only <u>state the</u> one you will be using during this research)
HP Zbook
Q57. How would you rank your laptop compared to other laptops on the market when you bought the
laptop?
High-end laptop
Mid-range laptop
Low-end laptop
Q76. In which year did you buy your laptop?
2018

SmartphoneLaptop

Q102. Which <u>brand</u> and <u>type</u> of portable speaker do you own? (if you have portable speakers only <u>state</u> <u>the one you will be using</u> during this research)

JBL go	

Q103. How would you rank your portable speaker compared to other portable speakers on the market when you bought the portable speaker?

- High-end portable speaker
- Mid-range portable speaker
- Low-end portable speaker

Q104. In which year did you buy your portable speaker?

2019
2019

Speaker position. Indicate in which area the speakers of your tablet are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

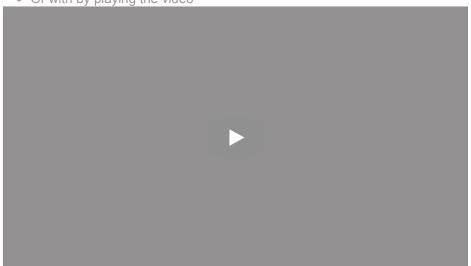
This question was not displayed to the respondent.

Q9. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



Or with by playing the video



This question was not displayed to the respondent.

Q13. Did you take the speakers and sound quality into acount when buying your tablet?

Q38. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the tablet, external speakers connected to the tablet or headphones that are connected to the tablet via either bluethooth or cable.

This question was not displayed to the respondent.

Q61. What is the reason for your choice in setup when watching YouTube?

This question was not displayed to the respondent.

Q58. What is the reason for your choice in setup when browsing social media?

This question was not displayed to the respondent.

Q59. What is the reason for your choice in setup when listening to music?

This question was not displayed to the respondent.

Q60. What is the reason for your choice in setup when watching Netflix or online television?

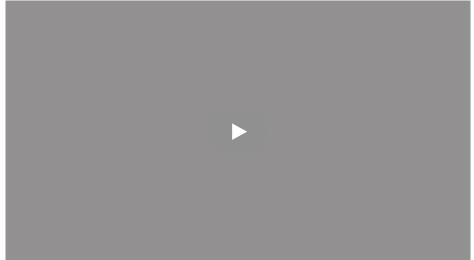
This question was not displayed to the respondent.

Q14. After listening to the song on your tablet, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a>)
- By typing the title in the search bar ( Queen Bohemian Rhapsody (HQ))
- · By scanning the QR code



· Or with by playing the video



This question was not displayed to the respondent.

Q15. Describe <u>positive aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

*Q16.* Describe <u>negative aspects</u> about the audio quality of your tablet. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

This question was not displayed to the respondent.

Q17. If you could change anything about the sound performance of your tablet what would it be? If you would not change anything you can leave this field blank.

This question was not displayed to the respondent.

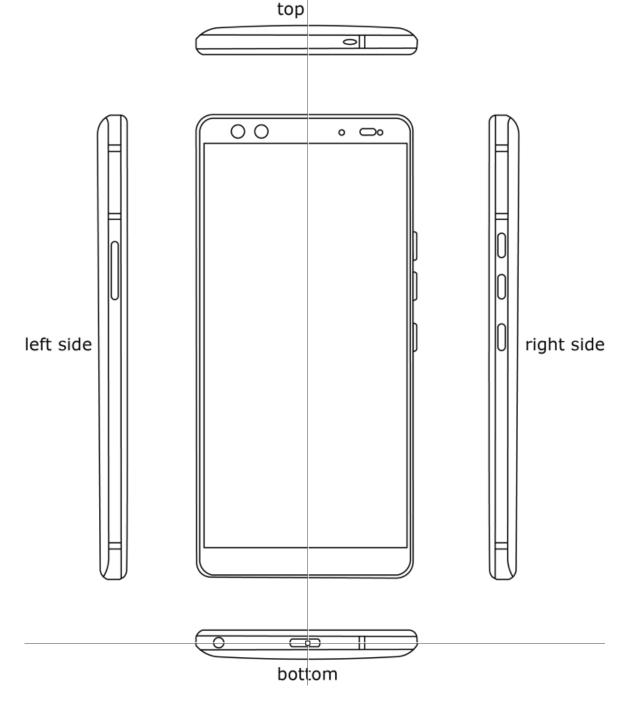
Q79. I would pay ... dollar/euro more for a tablet to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q80. I would be willing to choose a tablet that is ... milimeter (1 mm is 0.04 inch) thicker than my current tablet to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker tablet for a better sound performance set the slider to 0.

This question was not displayed to the respondent.

Q25. Indicate in which area the speakers of your smartphone are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 2 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.

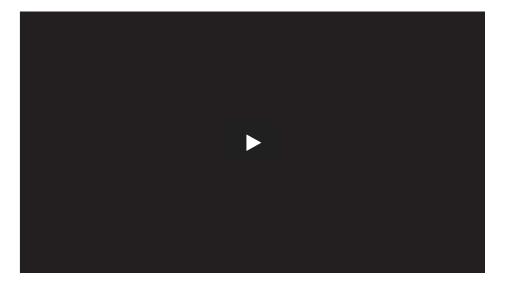


Q26. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
  By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



• Or with by playing the video



_		
	Mono	sound

- Stereo sound
- The sound changes with the orientation of the device

Q27. Did you take the speakers and sound quality into acount when buying this smartphone?

- Yes
- Maybe / I can't remember
- No

Q62. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the smartphone, external speakers connected to the smartphoneor headphones that are connected to the smartphonevia either bluethooth or cable.

	I would play the audio via the speaker of my smartphone	I would play the audio from headphones connected to my smartphone	I would play the audio from external speakers connected to my smartphone
Watching YouTube	0	•	0
Browsing social media (Facebook, Instragram, etc)	•		0
Listening to music	0		
Watching Netflix or online television	0	•	0
(Video) calling		•	

Q63. What is the reason for your choice in setup when watching YouTube?

- I don't want to bother other people
- O I don't want other people to bother me
- I can hear the audio better
- The sound quality is better
- Too much hassle to get another speaker or headphone
- The sound quality is good as it is without the need for extra devices
- Other

Q64. What is the reason for your choice in setup when **browsing social media**?

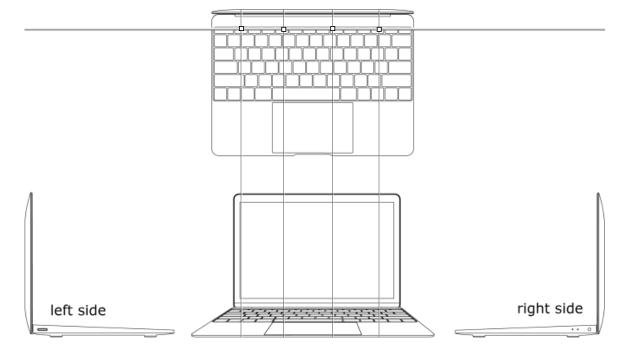
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q65.	What is the reason for your choice in setup when <u>listening to music</u> ?
•	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q66.	What is the reason for your choice in setup when watching Netflix or online television?
·	,
•	I don't want to bother other people
	I don't want other people to bother me
	I can hear the audio better
	The sound quality is better
	Too much hassle to get another speaker or headphone
	The sound quality is good as it is without the need for extra devices
	Other
Q28.	After listening to the song on your smartphone, how do you rate the audio quality on a scale from
	to five? You can test this with: The stereo test link ( <u>https://www.youtube.com/watch?v=Vt4CEfMTLJc</u> )
	By typing the title in the search bar ( Queen - Bohemian Rhapsody (HQ) )
	By scanning the QR code
	77.77.00 Services
	F580290-2812
•	Or with by playing the video

I don't want other people to bother me

I can hear the audio betterThe sound quality is better

		Excellent	Goo	d	Avera	ge	Poor		Terrible			
ıdio quality		$\circ$	0		•		$\circ$		$\circ$			
229. Describe pos												
eave this field blan Deep, Smooth, Pur	k. As an exa	ample you ca	an use wo	rds su	ch as: Cle	an, Full,	Strong, 0	Clear, Sp	acious,			
Harsh, Distorted.	icity, vvide, 7	Aggressive,	Brigrit, Sy	THE	c, Cruncity	, Louu,	Namow, i	IIII, Duii,	ruzzy,			
Clear, Strong, Loud												
020 Dogoribo <b>nog</b>	ativa aanaa	to about the	audio au	slity of	vour emer	tohono	If there o	ro not on	V VOIL COR			
Q <i>30.</i> Describe <u>neg</u> eave this field blan												
Deep, Smooth, Pur	ichy, Wide, A	Aggressive,	Bright, Sy	nthetic	c, Crunchy	, Loud,	Narrow, T	hin, Dull,	Fuzzy,			
Harsh, Distorted.												
Synthetic, thin												
Q31. If you could ch						our sma	rtphone w	hat woul	ld it be? If			
ou would not chan	ge anything	you can lea	ive this fie	ld blar	nk.							
Doopor sound loss sy	nthatia mara ha	200										
Deeper sound, less sy	nthetic, more ba	iss										
O94 Lwould nov	dollar/ouro	more for a c	martaban	o to m	aka tha nr	o dough	, atatad a	hangaa n	ossible A	divet the	alidar tı	a tha
Q <i>84.</i> I would pay ight amount. If you										kajust tne	silder to	) lite
					·							
	0	20	40	60	80	100	120	140	160	180	200	
Price	increase											3
Q85. I would be will	ing to choos	se a smartph	none that	is m	ilimeter (1	mm is (	).04 inch)	thicker t	han my cı	ırrent sm	artphon	e to
make the previously	y stated cha	nges possib	le. Adjust	the sli	der to the							
smartphone for a be	etter sound <sub>l</sub>	performance	e set the s	lider to	0.							
Thickness	0	2	4	6	8	10	12	14	16	18	20	

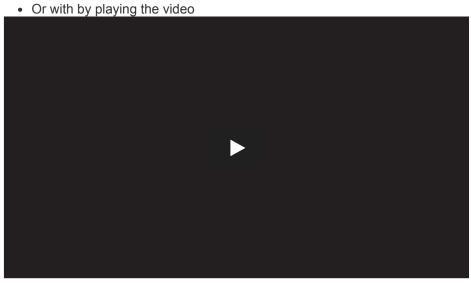
Q18. Indicate in which area the speakers of your laptop are located on the example image. You can indicate where the speaker is placed by clicking on that area. You can place a total of 4 speaker locations, each dot counts as one speaker in that location. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q19. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code





- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q20. Did you take the speakers and sound quality into acount when buying this laptop?

- Yes
- Maybe / I can't remember
- No

Q67. Select for each scenario which case is most common when to you want to listen to audio. You have the options to chose between internal speakers of the laptop, external speakers connected to the laptop or headphones that are connected to the laptop via either bluethooth or cable.

	I would play the audio via the speaker of my laptop	I would play the audio from headphones connected to my laptop	I would play the audio from external speakers connected to my laptop
Watching YouTube	•	0	0
Browsing social media (Facebook, Instragram, etc)	•		
Listening to music	•		
Watching Netflix or online television	•		
(Video) calling	•		

Watching YouTube	•	0	0			
Browsing social media (Facebook, Instragram, etc)	•	0	$\circ$			
Listening to music	•					
Watching Netflix or online television	•		$\circ$			
(Video) calling	•					
Q68. What is the reason fo	r your choice in setup whe	en <u>w<b>atching YouTube</b>?</u>				
<ul> <li>I don't want to bother other p</li> </ul>	eople					
<ul> <li>I don't want other people to be</li> </ul>	oother me					
<ul> <li>I can hear the audio better</li> </ul>						
<ul> <li>The sound quality is better</li> </ul>						
Too much hassle to get anoth	ner speaker or headphone					
<ul> <li>The sound quality is good as</li> </ul>	it is without the need for extra dev	vices				
Other						
<ul> <li>Q69. What is the reason for your choice in setup when browsing social media?</li> <li>I don't want to bother other people</li> <li>I don't want other people to bother me</li> <li>I can hear the audio better</li> <li>The sound quality is better</li> <li>Too much hassle to get another speaker or headphone</li> <li>The sound quality is good as it is without the need for extra devices</li> <li>Other</li> </ul>						
Q70. What is the reason fo		en <u>l<b>istening to music</b>?</u>				
I don't want to bother other p						
I can hear the audio better						
The sound quality is better						
Too much hassle to get anotle	ner speaker or headphone					
<ul><li>The sound quality is good as</li></ul>	it is without the need for extra dev	vices				
Other						
Q71. What is the reason fo	r your choice in setup who	en <u>w<b>atching Netflix or online</b></u>	television?			

I don't want to bother other people

- I don't want other people to bother me
- I can hear the audio better
- The sound quality is better

	Too much hassle to get anoth	her speaker or headpho	nie				
	The sound quality is good as	it is without the need for	or extra devices				
	Other						
five?	After listening to the s You can test this with The stereo test link ( !	: https://www.youtul	be.com/watch?	v=Vt4CEfMTLJc	)	from one to	
	By typing the title in the By scanning the QR of		ueen - Bohemia	an Rhapsody (HQ	(1)_)		
		삃					
		183		! !			
•	Or with by playing the	video					
		<b>•</b>					
		Excellent	Good	Average	Poor	Torrible	
Audio	uzality	Excellent	Good	Average	Poor	Terrible	
Audio q	uality	Excellent	Good	Average	Poor	Terrible	
Audio q	uality					_	
Q22. this f Smo	Describe <u>positive</u> as ield blank. As an exan oth, Punchy, Wide, Ag orted.	epects about the au	udio quality of y	our laptop. If the	re are not any yng, Clear, Spac	ou can leave ious, Deep,	
Q22. this f Smo Disto	Describe <u>positive</u> as ïeld blank. As an exan oth, Punchy, Wide, Ag	epects about the au	udio quality of y	our laptop. If the	re are not any yng, Clear, Spac	ou can leave ious, Deep,	
Q22. this f Smo Disto	Describe <u>positive</u> as ïeld blank. As an exan oth, Punchy, Wide, Ag orted.	epects about the au	udio quality of y	our laptop. If the	re are not any yng, Clear, Spac	ou can leave ious, Deep,	
Q22. this f Smo Disto	Describe <u>positive</u> as ïeld blank. As an exan oth, Punchy, Wide, Ag orted.	epects about the au	udio quality of y	our laptop. If the	re are not any yng, Clear, Spac	ou can leave ious, Deep,	
Q22. this f Smo Disto	Describe positive as ield blank. As an exanoth, Punchy, Wide, Agorted.  de, Full, Bright, Clean  Describe negative as ield blank. As an exanoth, Punchy, Wide, Ag	pects about the aunple you can use to gressive, Bright, Sepects about the anple you can use to	udio quality of y words such as: Synthetic, Crun	your laptop. If the Clean, Full, Stroichy, Loud, Narrow	re are not any yng, Clear, Spac w, Thin, Dull, Fu ere are not anyng, Clear, Spac	you can leave ious, Deep, uzzy, Harsh,	
Q22. this f Smo Disto	Describe <b>positive</b> as ield blank. As an exanoth, Punchy, Wide, Agorted.  de, Full, Bright, Clean  Describe <b>negative</b> as ield blank. As an exan	pects about the aunple you can use to gressive, Bright, Sepects about the anple you can use to	udio quality of y words such as: Synthetic, Crun	your laptop. If the Clean, Full, Stroichy, Loud, Narrow	re are not any yng, Clear, Spac w, Thin, Dull, Fu ere are not anyng, Clear, Spac	you can leave ious, Deep, uzzy, Harsh,	
Q22. this f Smo Disto	Describe positive as ield blank. As an exanoth, Punchy, Wide, Agorted.  de, Full, Bright, Clean  Describe negative as ield blank. As an exanoth, Punchy, Wide, Agorted.	pects about the aunple you can use to gressive, Bright, Sepects about the anple you can use to	udio quality of y words such as: Synthetic, Crun	your laptop. If the Clean, Full, Stroichy, Loud, Narrow	re are not any yng, Clear, Spac w, Thin, Dull, Fu ere are not anyng, Clear, Spac	you can leave ious, Deep, uzzy, Harsh,	
Q22. this f Smo Disto	Describe positive as ield blank. As an exanoth, Punchy, Wide, Agorted.  de, Full, Bright, Clean  Describe negative as ield blank. As an exanoth, Punchy, Wide, Agorted.	pects about the aunple you can use to gressive, Bright, Sepects about the anple you can use to	udio quality of y words such as: Synthetic, Crun	your laptop. If the Clean, Full, Stroichy, Loud, Narrow	re are not any yng, Clear, Spac w, Thin, Dull, Fu ere are not anyng, Clear, Spac	you can leave ious, Deep, uzzy, Harsh,	
Q22. this f Smo Disto	Describe positive as ield blank. As an exanoth, Punchy, Wide, Agorted.  de, Full, Bright, Clean  Describe negative as ield blank. As an exanoth, Punchy, Wide, Agorted.	pects about the aunple you can use to gressive, Bright, Sepects about the anple you can use to gressive, Bright, Sepects about the anple you can use to gressive, Bright, Sepects about the annual pressive, Bright, Sepects about the annual pressive annua	udio quality of ywords such as: Synthetic, Crun audio quality of words such as: Synthetic, Crun	your laptop. If the Clean, Full, Stroichy, Loud, Narrov	re are not any yng, Clear, Spac w, Thin, Dull, Fuere are not anyng, Clear, Spac w, Thin, Dull, Fuere	you can leave ious, Deep, izzy, Harsh, you can leave ious, Deep, izzy, Harsh,	

Deeper sound

390

Q82. I would pay ... dollar/euro more for a laptop to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.

(	) _	20 4	0 60	80	100	0 120	140	160	180	0 200	)	
Price increase												0

Q83. I would be willing to choose a laptop that is ... milimeter (1 mm is 0.04 inch) thicker than my current laptop to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker laptop for a better sound performance set the slider to 0.

(	0 2	2 4	4 6	8	3 1	0	12	14	16	18 2	0
Thickness increase											0

Q92. Check the boxes that apply for the purchase of your portable speaker

1	Sound	quality
1	Oound	quanty

- Size
- ✔ Price
- Design
- Build in light feature
- Bluethooth
- Connect multiple speakers toghether
- Charge phone with portable speaker
- Other
- None of the above

Q97. In which scenario's do you use your portable speaker?

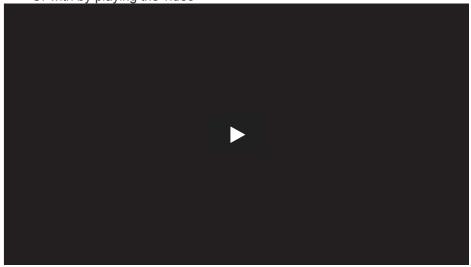
- Play music at a party
- Play music in a park/garden
- Play music in everyday use
- Play audio of movie or televison
- Use during (video) calls
- Sound during presentations or meetings
- As sound improvement during laptop use
- As sound improvement during tablet use
- As sound improvement during smartphone use
- Other
- None of the above

Q91. Is the sound mono or stereo sound? Mono meaning that the sound does not "move" from one speaker to another, which is the case for stereo. You can test this with:

- The stereo test link ( https://www.youtube.com/watch?v=6TWJaFD6R2s )
- By typing the title in the search bar ( #Stereo: Left and Right Stereo Sound Test )
- By scanning the QR code



• Or with by playing the video



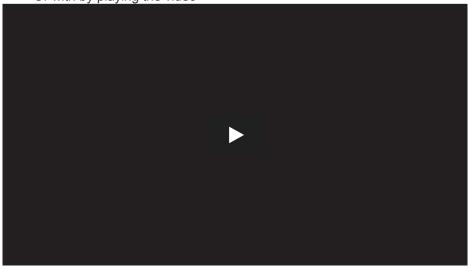
- Mono sound
- Stereo sound
- The sound changes with the orientation of the device

Q98. After listening to the song on your portable speaker, how do you rate the audio quality on a scale from one to five? You can test this with:

- The stereo test link ( <a href="https://www.youtube.com/watch?v=Vt4CEfMTLJc">https://www.youtube.com/watch?v=Vt4CEfMTLJc</a> )
- By typing the title in the search bar ( <u>Queen Bohemian Rhapsody (HQ)</u>)
- By scanning the QR code



• Or with by playing the video



	Excellent	Good	Average	Poor	Terrible
Audio quality		•			

Q99. Describe **positive** aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.

(	Clean, Full, Strong, Clear, Bright

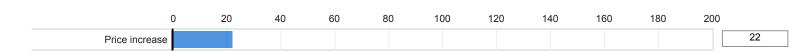
Q100. Describe <u>negative</u> aspects about the audio quality of your portable speaker. If there are not any you can leave this field blank. As an example you can use words such as: Clean, Full, Strong, Clear, Spacious, Deep, Smooth, Punchy, Wide, Aggressive, Bright, Synthetic, Crunchy, Loud, Narrow, Thin, Dull, Fuzzy, Harsh, Distorted.



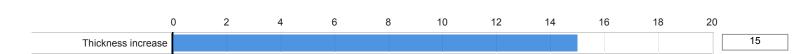
Q101. If you could change anything about the sound performance of your portable speaker what would it be? If you would not change anything you can leave this field blank.



Q102. I would pay ... dollar/euro more for a portable speaker to make the previously stated changes possible. Adjust the slider to the right amount. If you would not want to pay more for a better sound performance set the slider to 0.



Q103. I would be willing to choose a portable speaker that is ... centimeter (1 cm is 0.4 inch) thicker than my current portable speaker to make the previously stated changes possible. Adjust the slider to the right increase in thickness. If you would not want a thicker portable speaker for a better sound performance set the slider to 0.

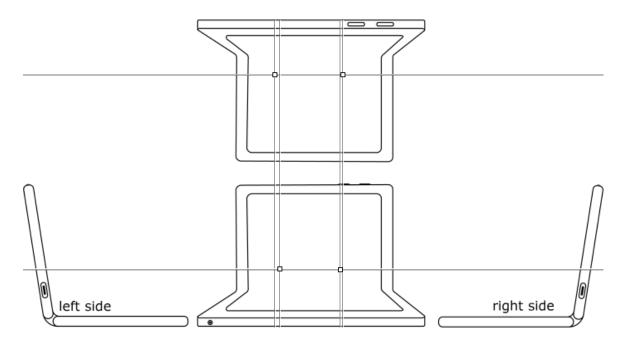


### Q28.

In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable laptop. This device has the same specifications as a well performing laptop but the screen covers the whole area of the laptop where the keyboard used to be. When the laptop is folded open in the laptop position the top of the screen can be compared to a regular tablet screen with another tablet screen as a keyboard. If the laptop is fully folded open it transforms in a 17 inch screen.



Q10. Where do you expect the speakers are placed in a foldable laptop? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q35. What would you expect from the speakers of the foldable laptop compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

Sound coming from different locations, so the orientation of the laptop makes no difference. Type of sound is the same as a normal high end laptop.

Q77. What is the main advantage of a foldable laptop compared to a normal laptop in your eyes?

Nice to watch movies, as you can use the full screen. Disadvantage would be that the experience of the buttons disappears.

Q36. Would the foldable laptop have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

	Excellent	Good	Average	Poor	Terrible
Audio quality	•	0	0	0	0

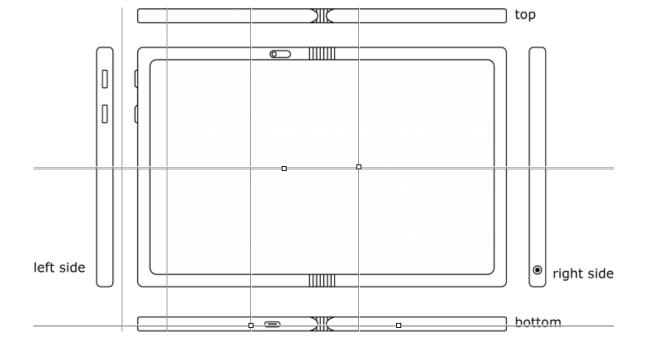
Q37. How would you rank the foldable laptop compared to your devices, based on your expectations about the foldable laptop? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Foldable laptop	1
Laptop	2
Portable speaker	3
Smartphone	4

Q45. In this section of the survey you are asked to state your expectations and assumptions about a new personal mobile device, the foldable tablet. This device has the same specifications as a well performing tablet but the screen can be folded in half to reduce the size. When the tablet is fully folded open the screen is 13 inches, but the tablet can also be used in a small laptop position. Each half is turned into a 9 inch screen, which can be compared to a small tablet.



Q46. Where do you expect the speakers are placed in a foldable tablet? You can select up to 4 speaker locations, each dot counts as one speaker in that location. In this case you don't have to use all 4 speaker options if you feel like this device will likely have less speakers. You can remove a dot by clicking on it and you can move it by pressing and holding down while moving the dot.



Q47. What would you expect from the speakers of the foldable tablet compared to your other devices? Think about amount of speakers, bass, volume, type of sound, location it is coming from etc...

No bass as this would make the tablet too thick to fold, more speakers to provide a good experience in every position, The speakers at multiple positions.

Q78. What is the main advantage of a foldable tablet compared to a normal tablet in your eyes?

Space efficient. Screen is protected when folded. Half of the screen can be used as keyboard.	
Space efficient. Screen is protected when folded. Hall of the screen can be used as keyboard.	

Q48. Would the foldable tablet have a mono or stereo speaker setup?

- Mono
- Stereo
- Mono, but the sound changes with the orientation of the device
- Stereo, but the sound changes with the orientation of the device

Q72. What would you expect the audio quality to be of a foldable tablet?

	Excellent	Good	Average	Poor	Terrible
Audio quality	•				

Q108. How would you rank the foldable tablet compared to your devices, based on your expectations about the foldable tablet? 1 being the best in terms of speakers and ascending to the device with the worst speakers.

Foldable tablet	1
Laptop	2
Portable speaker	3
Smartphone	4

Q31. What would you state	is your gender?						
<ul><li>Female</li></ul>							
Other							
I do not want to disclose this							
Q32. How old are you?							
,							
23							
Q33. What would you state	e is your nationalit	tv?					
•	,	•					
Netherlands							
004 Hammadanan atau							
Q34. How would you rate y	our nearing?						
	Excellent	Good	Average	Poor	Terrible		
Click to write Statement 1	•	0	0	0	0		
Q52. Check the boxes that	apply to you						
QUE. OTTOOK ATO SONOO MICE	apply to you						
Before this survey I was alre	ady familiar with foldab	le tablets and laptop	s				
✓ I would consider myself up to	date on technology tre	ends					
☐ I like to buy the newest personal mobile devices when they are released							
Q100. Is there anything you	u would like to let	us know either	about the topic of	of the survey or	the survey		
itself? If not you can submi	t the survey by cli	icking on next b	utton.	•	,		
L							

Q51. Lastly we would like to get some background information about who you are. We will keep this information anonymous so it cannot be liked to you as stated in the introduction.

Q109. For SurveyCircle users (www.surveycircle.com): The Survey Code is: G3LH-YBVM-Y719-SWNU or click the following link:  $\frac{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}{\text{https://www.surveycircle.com/G3LH-YBVM-Y719-SWNU}}$ 

## 8.11 Models

This part is removed due to confidentiality issues

# 8.12 Technical drawings

This part is removed due to confidentiality issues

You read my whole report.

I hope you enjoyed it and thing or two.

I learned a thing or two.

