The Sustainability of Online Concert and Live Concert

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Abstract. As environmental awareness grows, the world is increasingly focused on living a low-carbon, energy-sustainable lifestyle. At the same time, with the global outbreak of the COVID-19 in 2020, online concerts are growing rapidly to maintain social distance between people and keep isolated lives rich. Therefore, in this survey, we focus on the online music scene, which has flourished during the epidemic, and compares various indicators to find out which of the two forms of music, online or offline, is more sustainable. The article will use questionnaires, literature surveys, and three indicators - carbon footprint, water footprint, and economy - to discuss how much energy is consumed by both online and offline concerts. The energy consumption of a single person at an online concert is less than that of an offline concert. This research study will demonstrate to society the superiority of online concerts in terms of sustainability through a scientific and rigorous approach, which will be beneficial to reducing global energy consumption.

1 Introduction

Since the beginning of 2020, due to the outbreak of COVID-19, we have taken various measures to avoid the spread of the outbreak, such as wearing masks, isolation, and social distance. Among them, music festivals, live concerts, and other entertainment events have been forced to cancel to avoid the gathering of people to transmit the disease, which has caused a lot of inconvenience to people's entertainment life. In addition, in recent years, the earth we live on faces various serious environmental problems such as global warming and energy depletion. And for a long time, live concerts have been suffering from consuming a lot of resources and generating a large carbon footprint, which is unfavorable to the sustainability of the environment. Therefore, to enrich people's entertainment life while avoiding the spread of the epidemic and saving energy and protecting the environment, online concerts have emerged and become popular.

Live concerts and online concerts possess different characteristics. In a live concert, a large number of paper tickets are produced and mailed. Fans travel by various means of transportation to the concert venue and leave after the concert, generating significant carbon emissions during the commute. During the live concert, fans will bring products such as light signs to support their favorite artists. Most staff are needed to keep the live concerts in order. In an online concert, fans purchase electronic tickets on the internet. Most of the fans watch the online concert in their own homes, and some watch with a few close friends. Fans use their cell phones, computers, and other electronic devices to watch online concerts of about 2-3 hours in length, consuming large amounts of electricity.

This study focuses on and spotlight pop music and the pop group TFBOYS. This group has high popularity and influence in China and held large live and online concerts in 2019 and 2020. Therefore, we take the group as an example and calculate the energy consumption and economic benefits of online and offline concerts in terms of carbon footprint, water footprint, and revenue, respectively, to compare which is more in line with the concept of sustainable development. We provide a data reference for the environmental and economic impacts of music events and contribute to the sustainable development of our society.

2 Method

2.1 Source of Data

The whole survey is referred to a Chinese boy team called TF boys. Our team chooses them as the reference because they are very famous in the young Chinese generation, their fans can vote on behalf of most of the Chinese young generation attitude to the music event. Since there are many music events on live are canceled because of the COVID-19, they are the few bands that change their music event to the internet. They had the live music event in 2019 and the web music event in 2020. The time is very close to the present. Also, the music event in 2019 and 2020 is held in the Shanghai Mercedes-Benz Arena, which is more
contrastive. Their music event in 2019 and 2020 refers to the participator, price of the ticket, and souvenir.

In order to get the latest data to support our research, our team designs a questionnaire to know the habit of people when they participate in a live or web music event. There are thirteen questions in it. The template of the questionnaire will be put at the end of the article.

Because we use TF boys’ music event in 2019 and 2020 as the reference to hypothesize the participator, and most of their fans are the young generation, so our team screen out the questionnaire, which is accomplished by the people between 10 to 29 years old and also live in Shanghai. This is the data that will be used in the survey.

In this survey, because there are multiple choices in the questionnaire, our team uses Responsivity as the standard to compare each option. Responsivity is an indicator of the relative proportion of options selected. It's usually used in the comparative study of the market. It uses an option number selection to divide the total number of options selected in one question to get the percentage. The sum of the percentage of choice is one hundred percent in this computing method.

Since there is a lot of different wastage between live and web music events, our team choose six typical aspects to analyze: carbon footprint, water footprint, and finance as our standard of comparison. We analyze transport, ticket, light boards, electronics, merchandise, profit, and security.

| Serial Number | Question |
|---------------|----------|
| 1             | Do you live in Shanghai? |
| 2             | What is your age? |
| 3             | Do you intentionally choose public transportation with a low carbon footprint when you travel? |
| 4             | Which district do you live in Shanghai? |
| 5             | What transportation method do you choose if you are travel to Shanghai Mercedes-Benz Arena from your house? |
| 6             | How do you get your tickets for Live Concerts? |
| 7             | What electronic device do you use to watch Web Concerts? |
| 8             | Where do you typically watch Web Concerts? |
| 9             | How many friends do you watch Web Concerts with? |
| 10            | How long do you travel to your friend's house to watch Web Concerts? |
| 11            | What transportation method do you choose to travel? (To your friend's house) |
| 12            | How long do you travel to the Live Concerts with friends? |
| 13            | What transportation method do you choose to travel? (To Live Concerts) |

2.2. Methods of Computation

2.2.1 SPASS

SPASS is the software that offers different computing and statistics methods, including Pearson, Spearman, Kruskal-Wallis, etc. SPASS customers are mainly from education, medical care, government institutions, and well-known IT and Internet enterprises [1].

2.2.2 Carbon Footprint

Life cycle assessment (LCA) is used to estimate the total environmental impacts from producing a good or service. The full life cycle environmental impacts can be challenging to model because modern production "pathways" can involve numerous interacting technologies, each of which can consume materials and energy that are themselves products of complex production processes. In the present study, LCA calculates the carbon footprint of various parts in online concerts and live concerts, to quantify data and compare them directly [2].

2.2.3 Water Footprint

Water footprint (WF), an explicit multi-dimensional indicator measuring freshwater appropriation volumes by resource or pollution category, has been identified as a principal tool for water resources quantification analysis. The notion of WF, initiated by Hoekstra, mainly reflects the total freshwater water consumptive volume incorporating direct and indirect water. In the present study, WF is considered to compare the two types of the concert (online concert and live concert) and to judge which is more suited to the concept of sustainable development [3].
2.2.4 Finance

In the finance part, the concert organizer's profits are considered in the present research. During a concert, the organizer could earn profits by selling tickets, while they should also pay for the cost of the event. So the finance can be calculated by formula 1 [4].

\[ Finance = \text{Profit} - \text{Cost} \]  

3 Result and Discussion

3.1 Transport

The questionnaire we post shows where the young generation lives, how they travel and where they are going to go when they are going to watch a web music event, and so on. Also, we use the data of grams of CO\(_2\) per person kilometer travelled by different vehicles from an Australian agency called the Institute of Sensible Transport to calculate [5]. And because walk, the bike did not produce CO\(_2\) and subway, the bus will keep running no matter there is a music event or not, they don't need to be included. In the end, only the car, new energy vehicles, taxi, and electric bicycle need to calculate.

\[ \text{Grants of CO}_2 \text{ per person kilometer travelled} = \]  
\[ \text{Space required per occupant} \]

![Figure 1. Grams of CO\(_2\) per person travelled by different vehicles.](image)

3.1.1 Live music events

According to the TF boys 6th-anniversary concert, we suppose that the music event is held in Mercedes-Benz Arena, can hold 18,000 people in total. And in the survey, there are 18,000 people come approximately. The detailed data is shown in Table 2. The percentage in the third column is the proportion of the area of residence of those who completed the questionnaire to the total number of people. Using distances of each district to go to Mercedes-Benz Arena to multiply their proportion, add together then get the average distance of 18 km.

| District             | Distance | Percentage |
|---------------------|----------|------------|
| Huangpu District    | 15 km    | 7.32 %     |
| Xuhui District      | 15 km    | 4.88 %     |
| Jing'an District    | 15 km    | 2.44 %     |
| Putuo District      | 30 km    | 2.44 %     |
| Hongkou District    | 15 km    | 7.32 %     |
| Yangpu District     | 15 km    | 40.24 %    |
| Pudong new District | 10 km    | 8.54 %     |
Minhang District 20 km 20.73 %
Jinshan District 70 km 1.22 %
Qingpu District 50 km 1.22 %
Chongming District 100 km 1.22 %
Others 15 km 2.44 %

The proportion of vehicles that people choose to go to the Mercedes-Benz Arena is shown in the figure below. We can see there is 50 percent are made up of subway. New energy vehicles and cars both account for 4.35%. And 10.87% people use bus, bike and walk. 7.60% of people choose a taxi, and nobody chooses electric bicycles in the survey. Only 1.09% of people choose others, which is the scooter.

![Figure 2. The proportion of Vehicles People Choose.](image)

So, we can conclude the carbon footprint of live music events with Figure 3. So, multiply the percentage of people using cars to get to the Mercedes-Benz Arena by the approximate number of people involved in offline events. This gives the number of people using cars as transport for offline concerts. Then multiplying this figure by the average distance people travel from the Mercedes-Benz Arena and multiplying it by the carbon emission per person per kilometer travelled by car, we can conclude: this generates 3,436.1 kg of CO₂. Similarly, the data of CO₂ emission of taxis emissions are using the percentage of people using a taxi, which is 9.60%, to multiply the number of participants and multiply the average distance and multiply carbon emissions per person per person per kilometer travelled by taxi, which is 121.9. Since there are two people in the car, the formulas need to multiply by two extra. So, we can conclude: it generates 6,003.3 kg of CO₂. The carbon footprint of new energy vehicles has only two values that are different from the formula for cars. One is the percentage, for new energy vehicles this value is 3.35%; the other is the carbon emission per person per kilometer, each person will emit 209.1 grams of CO₂ per kilometer. The number of percentages is 1.09 % to carbon footprint of electric bicycle, the figure of Grams of CO₂ per person kilometer traveled is 6. By doing the calculations, the result can be derived as 21.27 kg of CO₂.

Adding up the carbon footprint of all the above means of transport, the total carbon footprint of the offline concert is 12,407.7 kg.
3.1.2 Online music event

According to the TF boys 7th online anniversary concert, there will be 700,000 people watch the music event approximately. The web music event allows people to enjoy it at any place at any time. So, there is a possibility that people go somewhere else. Only the people who go to a friend's house or go out will produce CO$_2$. According to the questionnaire, where people are willing to watch the web music event, 86.53% choose to stay at home to watch the web music event. Only 9.61% choose to go to a friend's house, and 3.84% of people go outside. It is shown in Figure 4.

So, these two types of data can be calculated with Figure 5.

This is because people can choose to go anywhere, they want when they attend an online concert and take any mode of transport they choose. So first calculate the carbon emissions produced by people who travel by car. The first step is to multiply the distance they are willing to travel for an online concert by the percentage of people who choose each distance. This is then multiplied by the carbon emissions produced per kilometer per person in the car and then by the number of people in the car. This gives the carbon footprint produced by people who choose to travel by car under the condition of participating in an online concert. Similarly, the same calculation is done for new energy vehicles and electric bicycles. The only difference in the calculation for taxis is that when...
multiplying by the number of people in the car, you multiply by two, not one. This is because you need a car driver to carry you.

Based on the web music event carbon footprint, which is 10,968 kg, according to this figure, we can calculate and conclude that the total carbon footprint of web music event transportation is 93902.4 kg.

3.1.3 Summary
By comparing the data, web music will produce 93902.4 kg carbon dioxide, which is more than 12407.7 kg from a live music event. This conclusion is extenuating because there are much more viewers on web music events than live music events. To compare these data more extenuating, our team use the total carbon footprint of web and live music events to divide the participators. In the end, web music events produce 0.206 kg CO₂ per participant which is less than 0.994 kg CO₂ from a live music event.

3.2 Tickets
For the live concerts, paper tickets are always necessary, and some of these may be delivered by express. The production of tickets and the transportation of the express would cause carbon emission and water usage. Also, the transportation of so many expresses would be costly. While for the online concert, people would not use tickets, but sometimes E-tickets.

3.2.1 Live Concert
The production and the printing of paper tickets can always cause carbon footprint and water footprint. The size and the mass of the ticket are often 140 cm² (7 cm×20 cm) and 7 g/cm² respectively, based on the preceded hypothesis (a live concert that holds at Shanghai Mercedes Benz Arena could generally contain 18,000 audiences [6]), so the total area and the total mass of 18,000 tickets are 252 m² and 1.764 kg respectively.

Researches show that [7] producing 1 ton of paper would consume 20 trees, and a tree can absorb 1.27 kg CO₂ per day. In producing 1 ton of paper, there would be 300 m² water, 500 kg of coal, and 2000 kWh electricity consumed. 1 ton of coal would produce about 2.66 tons CO₂ and generate 3000 kWh electricity; Printing one ticket would produce 3g CO₂ [8]. So, the carbon emission, including CO₂ that is produced by electricity consumption (paper production and printing), and the water usage, including water consumption for electricity generation, of 18,000 tickets’ production is 31.11 kg and 529.2 kg respectively.

The transportation of those paper tickets can cause a carbon footprint and cost, which the concert organizer should pay. The results of our questionnaire show that 56% of the audiences prefer to get their tickets on the spot on the concert day, others (44%) would like to get their tickets by post. The transportation of the expresses will cause the carbon emission with an average of 0.27 kg CO₂ per piece [9]. So, the carbon emission of the tickets’ delivery for a large live concert (18000 audiences) is 2138.4 kg. Because of the volume delivery demand, there would be some discount for each express. Provided that the price of each express is 0.77 $ (normally 1.54 $), so the cost of the tickets’ delivery is 6098.4 $.

3.2.2 Online Concert
For an online concert, people do not need to have access to the concert with paper tickets. They pay their bills online, and access to the concert would be unblocked automatically. So the production and the transportation of the concert tickets can be saved, which means there would not be carbon footprint, water footprint, and cost for the tickets in an online concert.

3.2.3 Summary
According to the analysis, the paper tickets’ carbon emission and water use for a large live concert that can contain 18,000 audiences [6] is 2169.51 kg and 529.2 kg respectively, the cost of these tickets’ transportation is 6098.4 $. While online concerts have no paper tickets, so it can be argued that there is no carbon emission, water use, and cost of paper tickets in this part. By contrast, an online concert is more sustainable than a live concert when considering the use of paper tickets.

3.3 Light Boards and Electronics
At a live concert, the fans would like to take some light boards to support their idols and record plenty of videos to commemorate this precious opportunity. While for the online concerts, people have no chance to use light boards, and what they can do is only sitting in front of laptops or TVs.

3.3.1 Live Concert
At a large live concert, the electricity consumed by the light board can cause carbon footprint and water footprint. A light board uses about 8 AA batteries (2000 mA, 1.5 V), and a AA battery consumes 3 Wh electricity. So if there are 18,000 audiences, the total power consumption of the light board is 3456 kWh, transform that into carbon emission and water use which is 3064.32 kg and 518,400 kg, respectively.

The electricity consumed by electronics can also cause carbon footprint and water footprint. Based on our investigation, almost all of the audiences would use their phones to take photos and record videos, the minority would take their cameras. Assuming that all of the audiences use their phones and all of the phones' batteries (4 Ah, 4 V) would be used, so the total power consumption of phones in a live concert is 288 kWh, transform that into carbon emission and water usage, which is 255.36 kg and 43,200 kg respectively. So the total carbon emission and water use of the light boards and electronics for a live concert is 3320 kg and 561,600 kg, respectively.

Because the light boards and the phones all belong to the audience, the concert organizer does not need to provide them, so there is no cost for those two electronics
in a live concert.

3.3.2 Online Concert

For the online concert, in our questionnaire is a question that "if there is an online concert, which place would you choose to watch it?" (Figure 6 A) According to the chart, most people choose to watch it at home, and about 10% of audiences choose to go to their friends' house. Other people would like to go to a coffee or a bar. So based on these data, the audiences' number can be estimated, 602,000 and 70,000, respectively.

For the people who choose to watch the online concert at home and their friend's house, two pie charts, as shown in Figure 6, A and B, show the electronics they use. The majority of the people who choose to watch the online concert at home (54%) prefer to use laptops, followed by tablet computers (32%). A small percentage of them use televisions (10%) and projection televisions (4%). While for the people who choose to go to their friends' house and enjoy the online concert with several friends, half of them choose laptops, and the number of ordinary assembling people is about 4.5. 20% of them would use tablet computers, and the same proportion would use televisions. People would assemble and use these two electronics with their 2.5 friends and 4 friends on average, respectively.

The power consumption of the electronics for these two cases can be calculated through the known ratios and data, which is 47,919 kWh and 1,916 kWh, respectively (Table 2). Therefore, the total power consumption of the electronics is 49,835 kWh. Transform it into carbon emission and water use which is 44,187 kg and 7,475,250 kg, respectively.

Table 2. The Power Consumption of the Electronics People Use at Different Viewing Place

| The Audiences' Number | The Electronics They Use to Watch the Concert | The Power Consumption of the Electronics |
|-----------------------|---------------------------------------------|-----------------------------------------|
| Their Own House        | Laptop, Television, Tablet Computer, Projection Television | 47,919 kWh |
| Their Friend's House   | Laptop, Television, Tablet Computer, Projection Television | 1,916 kWh |

Figure 6. Data about what kind of electronics people would use in different situations and the proportion of using different electronics. (a) The Place People Choose to Watch the Online Concert, (b) The Electronics People Use When They Watch the Concert at Home, (c) The Electronics People Choose When They Watch the Concert at Their Friend's House, and the Number of Average Assembling People.
3.3.3 Summary

According to the analysis, the carbon emission and water use of the Light Boards and Electronics for a large live concert which can contain 18,000 audiences is 3,320 kg and 561,600 kg, respectively. The Electronics’ carbon emission and water use for an online live concert that can contain 700,000 audiences is 44,187 kg and 7,475,250 kg, respectively. It seems that online concerts would generate more carbon emissions and use more water than live concerts, but this phenomenon is because of the tremendous population of the online concert. Per-capita carbon emission of a live concert (0.184 kg) is almost triple higher than that of an online concert (0.063 kg), and per-capita water use of a live concert (31.200 kg) is almost triple higher than that of an online concert (10.679 kg), too. So when comparing the per-capita carbon emission and per-capita water consumption, an online concert is more sustainable and environmentally friendly than a live concert.

3.4 Express for Merchandises

For the live concert, audiences can purchase the merchandise on the spot. While for the online concert, the merchandises should be delivered through express, whose carbon emission should be counted into our project.

3.4.1 Online Concert

The production of express boxes and the transportation of expresses would cause carbon emission, and the concert organizer has to bear the express charge. Based on a truthful online concert, only the audiences who bought the most expensive tickets can access merchandise. So, there would be 23,100 audiences buying the merchandises, which means 23,100 express would be delivered because of the online concert. According to some known researches (Table 3), the cost of each express [10] is $0.77 (The same thing as above, because of the volume delivery demand, there would be some discount for each express). The material of those expresses is always paper carton. An express made of the paper carton is 0.125 kg [10] on average, and it would cause 0.27 kg Carbon Emissions [11] (including production and transportation). The water use of one paper carton is 20 m³ [12]. So the total express cost is $17787, the total carbon emission and the total water use of those expresses is 2582.7625 kg and 57.75 kg, respectively.

| Table 3. Information from known researches of the Express |
|---------------------------------|
| Cost of per piece [10] | One express | Per ton paper carton |
| Carbon Emission [11] | Mass [10] | Water Use [12] |
| $0.77 | 0.27 kg | 0.125 kg | 20 m³ |

3.4.2 Live Concert

For the live concert, the merchandise is always delivered by the event organizers. The audiences can buy those things on the spot rather than delivery, which means there would be no carbon emission, water use, and cost for the express boxes. Though exactly in a live concert, those merchandises would be delivered by a truck, which could also cause carbon footprint and cost, normally compared with tens of thousands of express shippings. The carbon emission and cost for centralized transportation of a small number of goods (less than 18,000) could be ignored.

3.4.3 Summary

According to the analysis, for an online concert, the total express cost is $17787. The total carbon emission of merchandise express for an online concert is 2572.7625 kg. The total water use of express boxes production is 57.75 kg. The resources consumption of merchandises transportation for a live concert could be ignored. So, in this part, a live concert is more sustainable than an online concert.

3.5 Profit

In the financial section, revenues and costs are calculated separately for live concerts and online concerts to obtain profits.

3.5.1 Revenue, Cost and Profit of a Live Concert

For a live concert with 18,000 audiences, tickets are available at six different price points in dollars ($73, $103, $134, $164, $240, and $286). Based on the distribution and percentage of different price points, the total revenue of this live concert is calculated to be about $4,600,000.

A live concert and an online concert have various common costs. These costs include mainly the compensation of singers and other performers, stadium rental, costs for stage decoration and sound effects, promotion costs, salaries for logistics staff (stadium set-up, makeup, etc.), salaries for the director compensation team, and related approval fees. These common costs of a live concert and an online concert are around $46,000. A live concert also possesses some additional costs. A live concert requires hiring a security team to maintain the order, which costs around $23,000. In addition, some paper tickets need to be mailed to the audience. According to the questionnaire, about 44% of people want to receive
paper tickets before live concerts begin, so the cost of sending 7,920 paper tickets is around $6,000. The total cost of a live concert is about $75,000.

Based on the formula: Total Profit = Total Revenue - Total Cost, the total profit of a live concert is calculated to be approximately $4,525,000.

3.5.2 Revenue, Cost and Profit of an Online Concert

For an online concert, the price of each ticket ranged from $4.6 to $24, and the number of tickets sold was around 700,000. The total revenue from this online concert was approximately $12,000,000.

In addition to the common costs of a live concert and an online approximate $46,000, an online concert also possesses additional costs. According to the TFBOYS online concert, the 23,100 audience members who purchased tickets at the $24 price point have additional peripheral souvenir products. The total cost of producing and mailing these souvenir products was approximately $17000. The total cost of an online concert is calculated to be approximately $63,000.

Based on the formula: Total Profit = Total Revenue - Total Cost, the total profit of an online concert is calculated to be approximately $11,937,000.

3.5.3 Financial Comparison of a Live Concert and an Online Concert

The total costs of a live concert and an online concert do not differ much, but an online concert sells more tickets and gets total profit than a live concert because the number of audiences does not limit the online concert. Therefore, an online concert earns much more profit than a live concert.

| Table 4. Revenues, costs, and profits of a live concert and an online concert |
|---------------------------------|------------------|--------------------|--------------------|------------------|
|                                 | Revenue($)       | Common Cost($)     | Additional Cost($) | Total Cost($)    | Total Profit($)  |
| Live Concert                    | 4,600,000        | 46,000             | 29,000             | 75,000           | 4,525,000        |
| Online Concert                  | 12,000,000       | 46,000             | 17,000             | 63,000           | 11,937,000       |

The following graph compares revenues, costs, and profits of a live concert and an online concert.

3.6 Per Capita Carbon Footprint and Per Capita Water Footprint

The discussion in the previous section includes transport, ticket, light boards and electronics, merchandises, profit, and security. Carbon footprint, water footprint, and finance have been calculated about these six parts. When getting the summary, it is surprising that the total carbon and water footprint for the online concert are larger than that for the live concert, as shown in Table 5. However, based on the huge number of online concert-goers, it makes more sense to compare carbon emissions per capita and water footprint per capita to find a more sustainable approach (Table 6). Table 6 shows reasonable information about the comparison and supports the previous hypothesis that online concerts are more suited to the concept of sustainable development. Per capita, carbon emission and water use of a live concert are about 5 times and 3000 times that of an online concert. At the same time, the profit of an online concert is approximately 3 times that of a live concert. In summary, online concerts are more suited to the concept of sustainable development.

| Table 5. the Comparison of Live and Online Concert |
|---------------------------------------------------|-----------------|-----------------|-----------------|
| Number of Audiences | Carbon Footprint(kg) | Water Footprint(kg) | Profit(dollar) |
| Online Concert      | 700,000         | 144,326         | 57.75           | 11,840,231      |
| Live Concert        | 18,000          | 17,897          | 529.2           | 4,151,902       |

| Table 6. the Comparison of Live and Online Concert on Average |
|---------------------------------------------------------------|-----------------|-----------------|
| Number of Audiences | Carbon Footprint (kg/person) | Water Footprint (g/person) |
| Online Concert     | 700,000         | 0.206           | 0.082           |
| Live Concert       | 18,000          | 0.994           | 29.4            |
4 Conclusion

The normalization of the epidemic will gradually make online concerts a trend, not only because of the safe distance it gives people but also because it fits into the context of sustainable development. Through investigation and calculation in the present study, the sustainable development of online music events have been confirmed, the data support includes carbon footprint, water footprint, finance. With the guarantee of increased attendance, online concerts show a greater advantage in reducing carbon emission per capita and water footprint per capita, one fifth and three thousandths of those of live concerts. At the same time, because of the ease of participation and ticketing, the number of the audience shows a significant increase, which makes online concerts generate far more profit than live concerts, almost three times as much. This proves that online concerts possibly have the advantage for development shortly because online forms enable different people to enjoy the same experience with paying less money and time. However, such concerts still have some drawbacks, such as less infectious sound and live effects when compared with live concerts. However, such kinds of disadvantages might be solved by advanced technology in the future. And there is still more to be done to promote technological development for more sustainable online concerts.

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