

# Northumbria Research Link

Citation: Merritt, Kamarin and Zhao, Shichao (2022) The Power of Live Stream Commerce: A Case Study of How Live Stream Commerce Can Be Utilised in the Traditional British Retailing Sector. *Journal of Open Innovation: Technology, Market, and Complexity*, 8 (2). e71. ISSN 2199-8531

Published by: MDPI

URL: <https://doi.org/10.3390/joitmc8020071> <<https://doi.org/10.3390/joitmc8020071>>

This version was downloaded from Northumbria Research Link:  
<http://nrl.northumbria.ac.uk/id/eprint/48906/>

Northumbria University has developed Northumbria Research Link (NRL) to enable users to access the University's research output. Copyright © and moral rights for items on NRL are retained by the individual author(s) and/or other copyright owners. Single copies of full items can be reproduced, displayed or performed, and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided the authors, title and full bibliographic details are given, as well as a hyperlink and/or URL to the original metadata page. The content must not be changed in any way. Full items must not be sold commercially in any format or medium without formal permission of the copyright holder. The full policy is available online: <http://nrl.northumbria.ac.uk/policies.html>

This document may differ from the final, published version of the research and has been made available online in accordance with publisher policies. To read and/or cite from the published version of the research, please visit the publisher's website (a subscription may be required.)



Article

# The Power of Live Stream Commerce: A Case Study of How Live Stream Commerce Can Be Utilised in the Traditional British Retailing Sector

Kamarin Merritt<sup>1</sup> and Shichao Zhao<sup>2,\*</sup>

<sup>1</sup> Department of Computer and Information Sciences, Northumbria University, Newcastle-Upon-Tyne NE1 8ST, UK; kamarin.merritt@northumbria.ac.uk

<sup>2</sup> School of Design and Creative Arts, Loughborough University, Loughborough LE11 3TU, UK

\* Correspondence: s.zhao@lboro.ac.uk

**Abstract:** As e-commerce continues to grow on a rapid scale, the rise of new technological innovations has come about, such as that of live stream commerce, which has risen rapidly throughout China through the successful case of Taobao Live. Therefore, this research project is focused on live stream retailing as an e-commerce innovation to understand how the key aspects, such as usability, functionality, interaction, and, in general, how its success can be transferred into Western society. A mixed methods approach is taken to collect the crucial data that are needed to understand the current behaviours of British consumers and to understand their preferred methods of shopping and why. This study presents robust recommendations from the collected data, providing strategic insight into the adoption of live stream retailing in the West and incorporating the development of a live stream commerce plug-in prototype that has the potential to be transferred compatibility into any business model.

**Keywords:** British retailing sector; live stream; user experience research; e-commerce; open innovation



**Citation:** Merritt, K.; Zhao, S. The Power of Live Stream Commerce: A Case Study of How Live Stream Commerce Can Be Utilised in the Traditional British Retailing Sector. *J. Open Innov. Technol. Mark. Complex.* **2022**, *8*, 71. <https://doi.org/10.3390/joitmc8020071>

Received: 10 March 2022

Accepted: 15 April 2022

Published: 17 April 2022

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

## 1. Introduction

In recent years, there have been significant changes in technology and its adoption, whether for personal use or organisational. In addition, technology is enhancing how we behave and how applications themselves are used [1]. One of the biggest changes, mainly seen in Asia, is the adoption of live streaming, whether this is for daily entertainment, gaming, or retail shopping [2]. It allows anyone to share their experience through live events and engage with followers [3,4]. One of the most significant developments in the retail industry is the adoption of live streaming commerce to advertise products and engage potential buyers [5,6]. To put this into perspective, Chinese 'live stream-based retailing' has already provided significant support for the growth of this area, and in 2020 alone, it was projected that GBP 98 billion would be generated in China from e-commerce live streaming [7]. Yet, in the UK, especially during the COVID-19 times, alongside the high unemployment figures, SMEs have been suffering from a significant loss in sales and interaction, both due to closures and lack of technological adoption. Therefore, the potential of utilising live stream commerce is an area that needs to be explored. In the current literature, there is minimal discussion around how successful cases of live stream retailing can be transferred into Western society. This project will therefore investigate the literature around the topic of live streaming, analyse current cases of adoption, and engage with stakeholders to evaluate the current usage of live streaming.

The aim of this research is to investigate how the phenomenon of Chinese live stream-based retailing can enhance and transform the traditional method of British retailing. The key aim here is to critically analyse how live streaming is currently being adopted to support online retailing in China. These findings will be used to critically evaluate the

online shopping experience of British consumers. Leading on from this, potential design strategies will be developed to contribute to enhancing the UK retailing sector in terms of adopting the phenomenon of live streaming as a method of improving usability, interaction, satisfaction, and the overall user experience. The following research question has been outlined: ‘What can we learn from the successful case of Chinese live stream-based retailing to enhance and transform how technology is used in the traditional British retailing sector?’.

## 2. Related Work

While the topic of live streaming, as an open and innovative approach, is an area that holds in-depth research when it comes to gaming or social media, literature on the investigation and analysis of live stream commerce is considerably sparse, even though in recent years it has become a popular topic and the usage of it is growing rapidly [8–10]. Despite prior literature around the UK retailing sector showing significant adoption towards the use of omnichannel marketing that relies on the heavy usage of online communication to influence customer purchase intention [11,12], the global pandemic has shifted how we as consumers shop [13,14]. Hence, investigating alternative methods that are beneficial to the likes of self-employed shop owners, SMEs, or rural stores is crucial to the survival of the UK retailing sector. Therefore, this literature review will explore and investigate the current literature around the topic of live streaming in general, providing insight and critical discussions into how current cases of its adoption can be reflected upon and utilised in the transformation and innovation of technology currently being utilised in the traditional British retailing sector.

### 2.1. The Influence of Technology on Day-to-Day Life

The rapid development of technology is reshaping how we interact with daily discourse and activities, such as working, education, communication, and even shopping [15]. Technology and open innovation have shifted how we behave, and in recent years, the definition of a person’s lifestyle has changed significantly [16–18]. Previously, we would go about our daily life by commuting to a store, browsing clothing, or going to book an appointment physically. However, technology has gained a vast amount of attention from the younger demographic, more commonly known as ‘Millennials’ [19], which has consequently altered how society in general goes about said activities.

A key example of how technology has influenced our day-to-day lives is internet usage. In 2020, internet usage in the UK saw an increase of 2%, likely due to the ongoing COVID-19 pandemic and how using the internet has become more of a convenience (see Figure 1). This increase has indicated that in 2020, 92% of adults in the UK alone were recent users, with an estimated weekly usage of 24.9 h of activity [20].

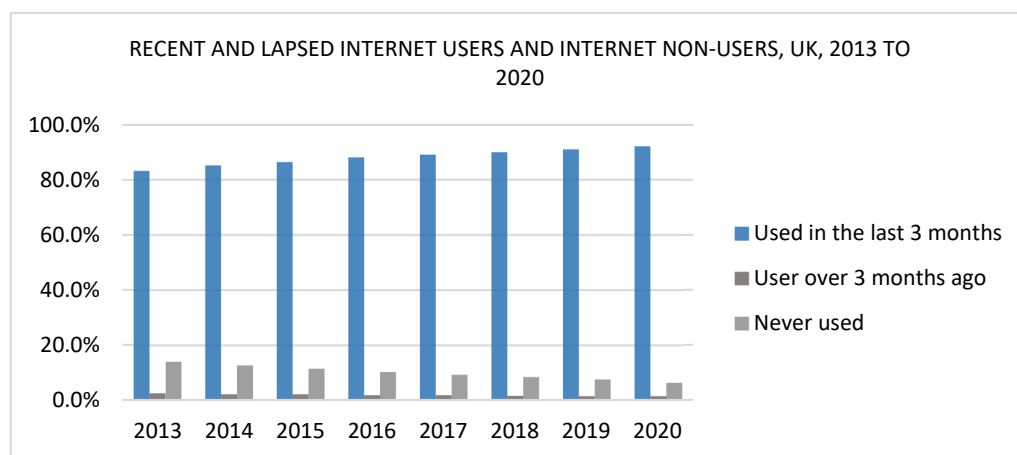


Figure 1. Recent and lapsed internet users and internet non-users, UK, 2013 to 2020 [13].

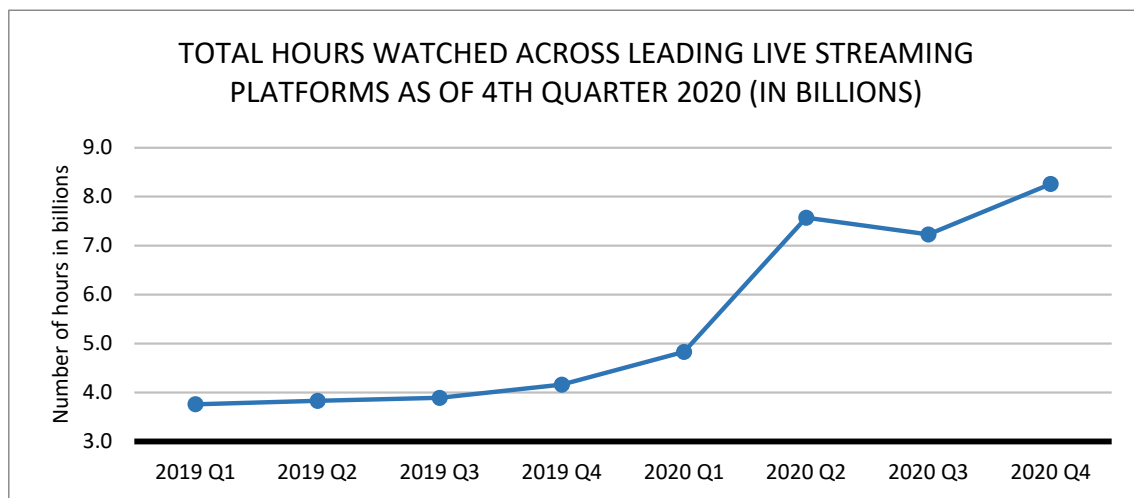
This internet usage is a significant factor in the success of multiple online applications, such as the usage of food delivery applications such as Deliveroo, UberEats, or Hungry Panda, which are changing how we eat out. Rather than physically going to eat out in a restaurant, these applications have brought the restaurant to the customer [21]. Likewise, with omnichannel retailing, as a result of the internet and the significant adoption of it by the likes of key retailers such as ASOS and Next, customer purchase intentions will never be the same and the retail sector is seeing fewer and fewer brick-and-mortar stores as a result of this shift online [22]. Additionally, another noteworthy example is that of work-related purposes, and this is the utilisation of Microsoft Teams, which saw a daily global increase from 75 million users in April 2020 to 145 million as of April 2021 [23]. This 103% increase is the result of work transitioning into the online domain and a hybrid working model being adopted within organisations [24].

Finally, one of the most societally and economically impactful technological developments is that of social live streaming services (SLSS), more commonly known as live streaming [25]. Live streaming, in general, has seen an increase in the number of users in the past two years, and in the UK, one of the most popular live streaming applications, Twitch, is currently seeing daily traffic of approximately 1.2 million active users [26]. According to McKinsey [6], it was reported that with how rapidly live stream commerce is growing, sales in China alone are expected to reach USD 423 billion by 2022. Additionally, it was also reported that the US live streaming market was forecasted to reach USD 11 billion by the end of 2021 and double to USD 25 billion by 2023 [27]. Therefore, the significance of live streaming in general is shifting the way we, as consumers, are utilising different methods to carry out our daily activities, and this method of interactivity is beneficial.

## 2.2. The Term 'Live Streaming' in Context

Live streaming does not have a universal definition even though it has been around for almost two decades; however, it has been defined in gaming as a new media that 'integrates' conventional broadcasting with social media [28]. Whereas Lu [29] defines live streaming as a synchronous, real-time interaction between users and streamers. However, Bründl and Hess define live streaming in a more valuable way and allow for a more universal definition, as they describe it as a place where users can both broadcast their own and watch other users' live content, alongside synchronously interacting with social functions such as chatting, following, and subscribing [30].

Live streaming enables users to carry out multiple actions in an online space to increase interactivity with others [31]. These activities range from sharing videos, screen-capturing gameplay, communicating, and through chat functions in real-time [3]. Currently, live streaming has been heavily utilised by social media platforms such as Facebook, Instagram, and YouTube. Although live streaming is not a new trend, it has yet to reach the commerce level it has in Asia, and in the West, they are lacking the 'live stream' element of success [29]. In recent years, live streaming has prospered due to key social media platforms adopting this new type of communication [32]. This has likely come about, as mentioned earlier, due to the rapid growth in internet users during the past year as a result of technological developments and COVID-19. In the latter quarter of 2020 alone, it was reported that over 8.26 billion hours of unique content were watched live across all streaming platforms [26]. From these statistics, we can see that going forward, its usage is going to continue to grow as this method of interaction is becoming the social norm (see Figure 2). Additionally, due to COVID-19, a significant number of streamers took to streaming after losing their jobs, as these platforms allowed for content to be freely created and opened an environment for users to engage and interact with this prospering new media [32]. This is an important factor when it comes to the success of live stream commerce, and why it is necessary to investigate this area in more depth, especially considering it is anticipated that 82% of internet usage will come from streaming by 2022 [33].



**Figure 2.** Total hours watched across leading live streaming platforms as of 4th quarter 2020 (in billions) [26].

### 2.3. 'Live Stream Commerce' Defined

According to Cai and Wohn, live stream commerce is the integration of e-commerce and real-time, synchronous interaction [34]. It allows for the live activity of selling products online via a 'streamer' introducing and demonstrating products, in turn motivating purchase intention [35]. It has been described as a novel shopping environment that facilitates a virtual space for viewers to watch and interact with the streamer and vice versa, which in turn promotes user attachment and enables streamers to build up a customer base [36].

Live stream commerce is an industry that has become increasingly popular among Chinese consumers, generating immense interest between society and researchers [8]. Particularly in China, there are multiple successful platforms that adopt live streaming, such as Taobao Live, Baidu, and Bilibili [22]. However, unlike the typical live streaming applications in the West that focus on live streaming gaming or communication (i.e., Twitch), China has created a business transformation in how the e-commerce sector operates, and in May 2016, Alibaba (China's biggest commerce company) introduced Taobao Live, unexpectedly creating the next wave of the e-commerce revolution [6].

Taobao is an integrated online shopping platform that combines the typical online shopping ability with a plethora of additions, for example, live streaming, which enables users to interact, comment, and ask questions through live streaming capabilities [37]. As a result of this transformation, in less than five years, China's live streaming commerce strategy has seen a rapid market growth that has sky-rocketed the e-commerce market size, with an estimated market size of 1.2 trillion yuan, roughly USD 184 billion [22].

Clearly, Chinese companies can transform their businesses rapidly as the market changes. When looking into the main social media platforms, compatibility is an aspect they have considered significantly, which enables the adoption of a new functionality to be integrated swiftly, as shown in Alibaba's original integration of Taobao. From a business and social media perspective, compatibility is a significant aspect; companies are very quick to amend their current operations and integrate new ventures. This is an important finding that would be beneficial to all operating businesses, especially when it comes to the topic of the past two years, in which we saw a significant number of businesses close worldwide due to COVID-19 [38].

China has enabled hundreds of self-owned or family-owned businesses to prosper not only through the global lockdowns but also, in general, through live streaming commerce [39]. For example, despite facing large disruptions during the pandemic, small businesses and farmers in China boomed, whereas those in other countries suffered. China's success is thanks to the adoption of live streaming commerce, which helped develop 'rural live streaming initiatives' to help those who would have most likely suffered administration

succeed and remain afloat [40]. Therefore, while there has been less adoption of live streaming applications that are separate from the generic social media and gaming platforms, such as Facebook or Twitch, it is imperative that the successful case of Chinese live commerce is reflected upon by the West. Thus, consequently leading back to the research question, it is important to investigate the current user behaviour within e-commerce and investigate what the limitations are, but also what the benefits of live stream commerce are.

#### 2.4. User Behaviour in e-Commerce

Two decades ago, Kalakota and Whinston defined e-commerce as utilising technology to exchange merchandise online [41]. However, nowadays, the definition has shifted and has now been defined as the operational activity that involves the use of the internet to transact business [42]. To add to this, Vladimir highlights that e-commerce refers to the exchange of online data and transacting business through telecommunication (i.e., the internet) [43].

Nowadays, e-commerce has shifted how consumers shop and has brought the shopping experience even closer to the consumer through computer and mobile integration. In e-commerce, consumer behaviour differs greatly than it would in traditional brick-and-mortar settings [44]. The biggest impact that e-commerce has had is on consumer behaviour and their habits, which is due to a magnitude of reasons as reported by Bragg as follows: 1. convenience; 2. unrestricted purchasing (i.e., 24/7); 3. time-saving; 4. options; 5. accessibility [45]. These behavioural changes have come about due to various reasons that relate to the changing human lifestyle, such as time constraints or work [46]. However, it was noted by researchers Mehta, Saxana, and Purohit that consumer behaviour is shifting again, and customers are searching for a more satisfying customer journey [47].

##### 2.4.1. Customer Satisfaction in Online Commerce

Customer satisfaction is the most important element of the whole customer journey. It is an organisation's natural resource, and without it, they could fail; therefore, it is imperative that this is preserved [48]. Oliver defines customer satisfaction as the customer's fulfilment 'response'; it is an experience that a service or product provides [49]. While this is a universal definition, a definition by Chang et al. goes more in-depth, defining customer satisfaction as the psychological reaction between a customer and their experience between an expectation of service and the received service [50].

The biggest challenge that online retailers are facing today is maintaining satisfaction levels, especially with sales shifting online [51]. Research by Kurata and Nam found that in-person customer satisfaction levels are often maximised by the utilisation of communication, engagement, and gaining quick responses to questions; however, where online commerce has taken dominance, meeting these core elements has become challenging [52]. When shopping online, consumers are generally looking for interaction; however, a further aspect they are looking for is social interaction, which acts as an influencer to purchase intention. It was found in a recent study that customers view their computer as a digital social actor, and if the presence of a live chat function is not there, they are often left unsatisfied when it comes to the social aspect of their experience [53]. Additionally, it was also found that even when a live chat function is available, wait times can often be quite lengthy, influencing dissatisfaction [53]. Furthermore, chatbots with automated responses were found to decrease satisfaction levels as they lacked the real support customers wanted to experience while shopping online; these being empathy, responsiveness, assurance, and reliability [53]. Moreover, customers often found that product reviews were a core influencer in the decision-making process; however, this has now become less of an influence as studies have found that some organisations try and publish fake and inaccurate reviews of their products to increase the reputation of their service [54]. On the other hand, as clothing stores began to close and only have an online presence, viewing products you will only see upon arrival is now a big disadvantage to customer purchase intention; however, live stream commerce can facilitate this gap.



Due to these implications, and a lack of real social interaction, it has been reported that a significant number of transactions fall through due to negative customer satisfaction [55,56]. Additionally, due to COVID-19, customers are now frightened or prefer not to go into physical stores [57,58]. Thus, it is imperative that the influence of purchase intention and customer satisfaction is retained online.

#### 2.4.2. How Customer or User Satisfaction Is Met through Live Stream Commerce

To be successful, a company must ensure it delivers high-quality experiences, which often create loyalty [59]. These high levels of satisfaction require high levels of service quality too, as this is the key to obtaining favourable behaviour [60]. Live stream commerce can impact customer purchase intention, and this is done through boosting satisfaction levels. For example, there are multiple ways consumers can be engaged or express their satisfaction in live stream commerce, as shown in Table 1.

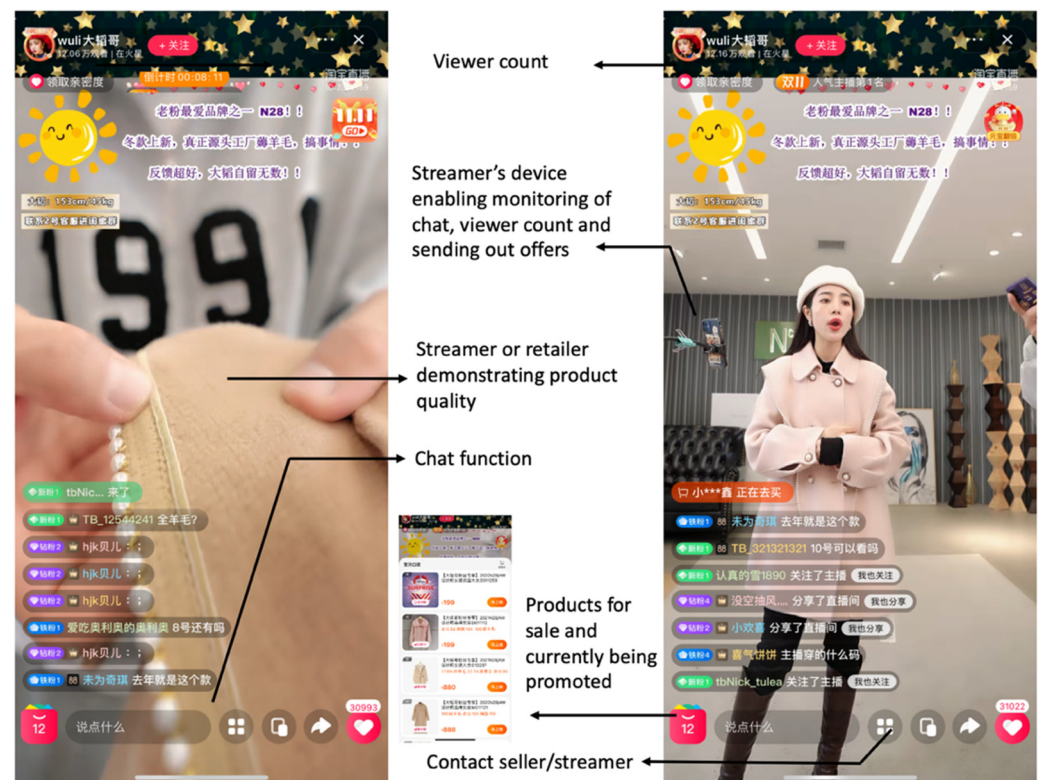
**Table 1.** Methods in which viewers can be engaged or express their satisfaction in live stream commerce.

<b>Chat Functions</b>	users can chat amongst each other, express their opinions and questions via chat functions in a live stream
<b>Viewership</b>	often associated with high user or customer interest, the more viewers the more customers and in turn more satisfaction
<b>Followership</b>	users can show their loyalty or interest in a streamer through following their channel, which will alert them when they next go live
<b>Channel Subscription</b>	users can show their loyalty and satisfaction to a streamer by paying a monthly/annual subscription, which also reaps user benefits
<b>Monetary Donations</b>	users are able to send monetary gifts or donations to their streamers, in Twitch these are known as ‘Bits’

A recent study found that the exchanging of virtual gifts increases customer satisfaction, as the responses users gain from the streamer act as a positive influence on their emotions, encouraging purchase intention [32,61]. Thus, in contrast to traditional shopping in brick-and-mortar stores, these web-based social interactions act as a motivator and influence when it comes to purchasing intention. Additionally, with live stream commerce, consumers can view products in real-time, ask questions, and view them being demonstrated from multiple angles. However, when shopping online, you can view clothing in a flat form via an image that does not encourage customer purchase intention at all. Similar to customer reviews, these are often untruthful or deemed an inaccurate representation of opinions as they are often skewed [54]. Furthermore, when a live stream is taking place, applications such as Taobao allow consumers to post their comments in the chat, enabling their questions to be answered (see Figure 3).

Overall, this functionality enables the consumer to have the freedom of interacting with others, asking questions, and voicing their opinions, all of which help with current customer purchase intention and satisfaction. To add to the above, the additional benefits of engaging with a live streamer are credibility, after-care, trust, and loyalty.

In general, a combination of both chat functionality and intractability available within the user interface of the application results in live stream commerce delivering a more narrative experience, as consumers are more engaged in the process and can receive the social interaction they strive for [39,62]. This is a core element to the success of the business as the customer journey becomes flawless [62].



**Figure 3.** Screenshots taken from a live stream on popular live stream commerce application Taobao, demonstrating the functionality between streamer and consumer.

### 2.5. Core Usability Principles within Live Streaming

The early adoption of live streaming did not reach its full potential due to accessibility, or technological and social barriers [39]. In general, there are the following two key components in live streaming: 1. interactivity; 2. usability [63]. It was noted that interactivity makes live streaming engaging for consumers as they can view products in real-time and ask questions, unlike traditional online commerce the West use [64]. Whereas usability relates to the user interface of the application itself, what the layout of the core functions (i.e., chat, follow) is, and how simple it is to interact with [65]. However, in live streaming applications, there are many functions that a user can interact with, such as the ‘picture in picture’ strategy, which is frequently utilised in interface design. This can potentially enhance the convenience of video watching during the experience (e.g., by checking details of products) or provide a multi-task operation, for example, logging into the payment page. More importantly, it could support users to be engaged in limited-time sale events. Users could then have more time to freely switch between live stream sessions and product pages. These functionalities ensure the user can utilise the application easily while interacting with various aspects. Customised on-demand components were also designed in the user interface of Taobao live streaming to support consumers to get to know which products they would like to get to know more about. Users can not only watch previously recorded videos but can still ask for a specific product to be featured and demonstrated. Compared to earlier studies that emphasised understanding live stream practises in general and potential challenges faced, there were very few insights and discussions into the designing of a novel user interface that promotes the various services mentioned above [39]. This is strengthened by Huang and Benyoucef, who found that there are the following features that are imperative to ‘effective’ e-commerce: usability; the quality of information; the quality of website; customer service; enjoyability [66].



## 2.6. *The Dynamics of Open Innovation in Retail Commerce*

Open innovation is a holistic approach that has a focus on innovation management [67]. It systematically encourages the investigation into a plethora of macro and micro sources of opportunities with regard to innovation and how these opportunities can be exploited through multiple channels [67–69]. It contributes to an organisation's capability through seizing opportunities and creating a knowledge base by stimulating new ideas, behaviours, and approach modifications [70]. This relates heavily to retail commerce and how both e-commerce and m-commerce have begun to be adopted through many retailers, such as Next and Alibaba, for example. As stated by many researchers, the fourth industrial revolution has seen the brunt of open innovation and its rapid growth due to innovation culture [70,71], which is based on consumers or users wanting to integrate anything desirable or useful into their experience, often as a result of a societal shift (i.e., COVID-10), thus proposing the need to understand innovation culture and how it can control open innovation dynamics and its augmentation [72]. Therefore, based on this, we can see how e-commerce and m-commerce have rapidly adapted due to cultural and societal impact, such as the likes of Alibaba and how live stream commerce has taken off so successfully in China. Thus, understanding the dynamics of open innovation in retail commerce is of great importance [18], as it has been stated that it is built on values such as creativity, flexibility, and curiosity because of the openness it requires [73,74]. This paper will do this by investigating how live stream commerce can support retail operations within the UK retailing industry.

## 2.7. *The Ethics and Social Aspects of Technology*

The purpose of designing technology is often related to a service or to providing a specific function. For example, a messaging application that has the purpose of enabling a person-to-person contact via telecommunications [75]. Nowadays, technology is growing even bigger, and the ethical and social aspects behind it are also increasing. There are several ethical factors when it comes to technology, its adoption, and daily use. Sommerville refers to ethics as the governing, conducting, and principles of behaviour [76]. It is imperative as an organisation, a developer, or even a software engineer to consider the potential implications a piece of technology will have when it comes to the collection, storage, and usage of data, as well as other aspects such as accessibility. Secondly, while the adoption of technology is essentially mandatory for most business operations, there are several impacts these technological developments may have on society, such as health issues, unemployment, and so on. A key example of how technology is negatively impacting society is through the usage of artificial intelligence and algorithms in the workplace. These small changes impact the workforce greatly as some roles may become obsolete due to technology's being able to, for example, analyse data or utilise AI to sift through job applications [77].

## 3. Methodology

As addressed in the literature review, live stream commerce is becoming an area of significant importance, alongside gaining traction in its field. However, the literature on how countries outside of Asia can adopt it is very sparse. Therefore, to contribute to and fill this gap, the researchers will investigate and critique potential research methodologies to ensure the correct one(s) is applied when it comes to data collection. Within this study, it is important that data surrounding user experience are obtained, including insights into preferred methods, behaviour, emotions, and individual perceptions of usability.

### 3.1. *Quantitative Research Methods*

Quantitative research methods have been described as a fundamental approach in social research [78]. It has a focus on the numerical side of data, which can be quantified and analysed through statistical analysis to provide and support claims, which in turn generalises findings and explains phenomena [79]. There are various advantages to using quantitative research, which include utilising statistics to generalise findings, which in turn

can provide explanations for past, current, and future events [80]. Quantitative methods are best used when research is involved with quantifying findings to provide accurate outcomes such as measuring population [81]. Considering the scope of this research, there is a broad range of questions that need to be asked. This makes quantitative methods a beneficial choice for the data collection stage, as they can measure variances or test a hypothesis for reasoning behind an occurrence [78]. While the origins of quantitative research do not embody the same degree of philosophical and paradigmatic diversity as qualitative does, it holds a plethora of approaches whether they are exploring, describing, or explaining [79].

### 3.2. Qualitative Research Methods

Qualitative research seeks to analyse data from direct connections with participants through approaches, such as workshops, interviews, or written notes from observations [68]. Unlike quantitative research methods that aim to focus on numbers to validate a hypothesis, qualitative methods focus on analysing expressions, feelings, and behaviour within a natural context [82]. Therefore, this research method can design approaches for multiple fields such as psychology, social sciences, or design and upon completion can provide in-depth rich findings, which may be otherwise absent in statistical data [83].

Considering the scope of this research is to critically evaluate the experience of British customers shopping and reflect upon potential interactive design strategies to develop prototype recommendations, it is imperative that a research method is used that can draw out key themes, emotions and behaviours, all of which would not be obtainable from a questionnaire, as stated by Flick, the researcher's main motivation for utilising qualitative methods should derive from the direction to the research question itself [84]. Furthermore, within Human-Computer Interaction (HCI) and User-Centred Design (UCD) there have been recent approaches known as Participatory Design and Co-Design. It is important to mention that these methods engage significantly with the stakeholders involved and unlike the generic approach of a semi-structured interview, allow for the researcher to work together with the stakeholders rather than working as their leader [85].

#### 3.2.1. Participatory Design

Participatory Design (PD) came about during the 1960s because of social, political, and civil rights movements, in which Western society demanded more participation in the decision-making process of many aspects of life [86]. PD is a method that supports democratic decision-making when it comes to responding to societal phenomena, mainly where there is an imbalance of power that may impact design [87]. It is an approach to the assessment, design, and development of technology or ideas [88]. In general, PD has been described as a process by which we investigate, understand, analyse, establish, develop, and support mutual learning in a reflect-in-action scenario [89].

PD is utilised by many researchers as it seeks to enable users who will use an application to be involved in the design, usability, and experience of it without having to understand all of the background aspects of it such as coding [87]. It simply allows for voices to be heard, expressions and suggestions to be made, and insights to be given. For example, Morten Kyng observed during the 1970s and 1980s that within the adoption of computers in the workplace, many participants could see the influence of this technology and the future of working with it, whereas those not actively involved in the process were unable to see the future of this technology and envisage it in their day-to-day work [90,91].

#### 3.2.2. Co-Design

Co-design is a method that has been utilised heavily in HCI, social, and technology design, as well as public and government services [92,93]. This method is often applied by designers following on from reflections that emerge from participatory developments regarding a phenomenon, such as utilising participatory design as an approach to gain insights and opinions on a current situation, then using these as pre-requisites to designing

and developing concepts through co-design [94]. In general, co-design allows for the formation and assessment of prototypes, applications, and services with the involvement of user opinion, which enables improvement [95].

The purpose of mentioning co-design is that it can be used alongside PD. For example, PD can take place in the form of a workshop where you gain insights and recommendations from stakeholders who are going to use an application. Then co-design can take the form of a follow-up workshop and be utilised to push forward the design strategy in terms of application design, functionality, and sustainability [96].

These methods are beneficial when used alongside each other because they can establish robust recommendations from a wide range of stakeholders, which once reflected in the design can be beneficial for users in the long run [97]. Both PD and co-design can be utilised as a method in workshops with participants, in which the researcher partners with them to ensure a level of mutuality, in turn ensuring knowledge, ideas, and product generation are understood from an unbiased perspective [89].

Overall, there are a plethora of benefits to using qualitative methods; however, there are also limitations. For example, one of the most significant limitations is that the findings cannot be extended to a wider audience as generally the captured findings are from groups of participants that do not represent the population as a whole [98,99].

### 3.3. Mixed Research Methods and Adopted Methods

When it comes to mixed methods, there is an ongoing debate about this research paradigm and its appropriateness within research. Yet, mixed methods do not cause conflict between each method, but in fact attempt to respect both viewpoints by pursuing a 'middle ground' for the problem of interest. As stated by Johnson, Onwuegbuzie, and Turner mixed methods is an approach that attempts to understand and capture multiple perspectives by combining those that may come from alternative methods [100].

One of the beneficial factors of utilising mixed methods is that it ensures the production of robust and compelling results [101]. Furthermore, another benefit stated by Creswell is that data collected from qualitative approaches allow for more in-depth findings, which are strengthened by the statistics of quantitative data [102]. Additionally, when it comes to open forum situations such as semi-structured interviews, participants can speak their minds and open up to potential areas that may have been missed in more structured approaches [94,103].

Creswell stated that if one compared both quantitative and qualitative traditions, of course there are differences, but they do not conflict; they work together when needed or work individually in line with what we as researchers want to know [104]. Additionally, Queirós, Faria, and Almeida state that qualitative methods draw out theories, whereas quantitative test theories or hypotheses; the qualitative methodology aims to comprehend complexity and the meaning of actions for example, whereas quantitative methodology aims to acquire accurate and reliable statistics that can be analysed to generate hypotheses precisely [105]. To correctly respond to the research question, it is often necessary for researchers to adopt a mixed methods approach; therefore, allowing the retrieval of both numerical and textural data [79]. Thus, in this research project a mixed method approach is going to be adopted. The purpose of choosing a mixed methods approach is to eliminate the scenario of limitation regarding 1. not having enough statistical data if using solely a qualitative method; 2. not having enough key themes, findings, and insights if using solely quantitative methods.

Within this study, the first stage will be to conduct survey research. This method is used to gather a group or individuals' expressions, opinions, and beliefs. This will be through quantitative methods, which will be in the form of a questionnaire. This will ensure that well-informed insights are made into how consumers behave with, adopt, and utilise technology in their shopping experience. The second stage of data collection is based around utilising workshops as a method and incorporating PD and co-design techniques to enhance both outcomes.

#### 4. Design Study and Data Analysis

This section will outline and discuss the methods adopted for data collection, the recruitment of respondents/participants, and how the data were analysed and address the key findings.

##### 4.1. Method

To answer the outlined research questions, the following three empirical investigations were conducted: a questionnaire; participatory design workshops; co-design workshops.

##### 4.1.1. Questionnaire

The first method adopted was quantitative research, and this took the form of a questionnaire. The data captured were categorical due to the questions being nominal, ordinal, and dichotomous. The questionnaire was conducted virtually via Google Forms. This ensured the data collected remained in the lower risk (medium) ethical category while still being able to reach a broad range of respondents. By using Google Forms questions were able to be branched and specific answers would take a specific route in the questions. The questionnaire was distributed via the social media platform Facebook and directed towards a smaller geographical area in the Northeast of England, specifically South Tyneside. The reason for focusing on this location was to capture how this area perceives, behaves, and understands live streaming and retail. When it came to the design of the questionnaire, it was imperative to ensure that the questionnaire was clear, unambiguous, and was understanding to respondents. When it came to the questionnaire, there were a total of 17 questions that respondents would have to answer, some of which were branching depending on the respondents' choices. The questionnaire has been outlined in Figure 4 below.

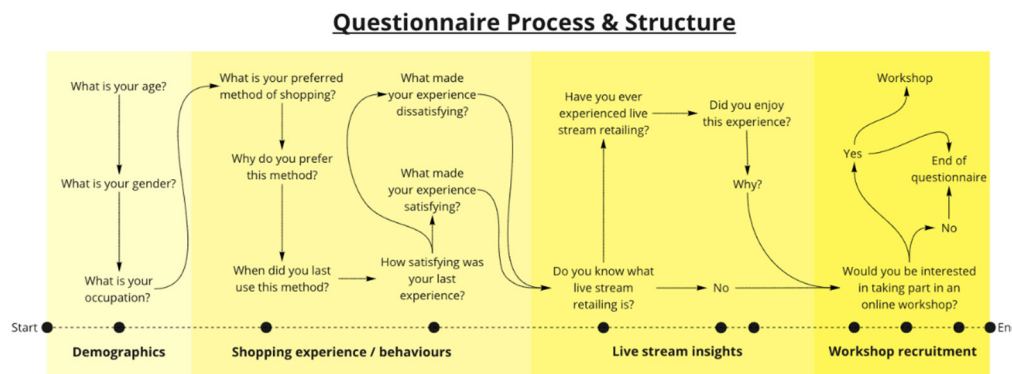


Figure 4. Research questionnaire outline, illustrating different stages, and potential insights/findings from questions—created in Miro.

##### 4.1.2. Co-Design Workshop

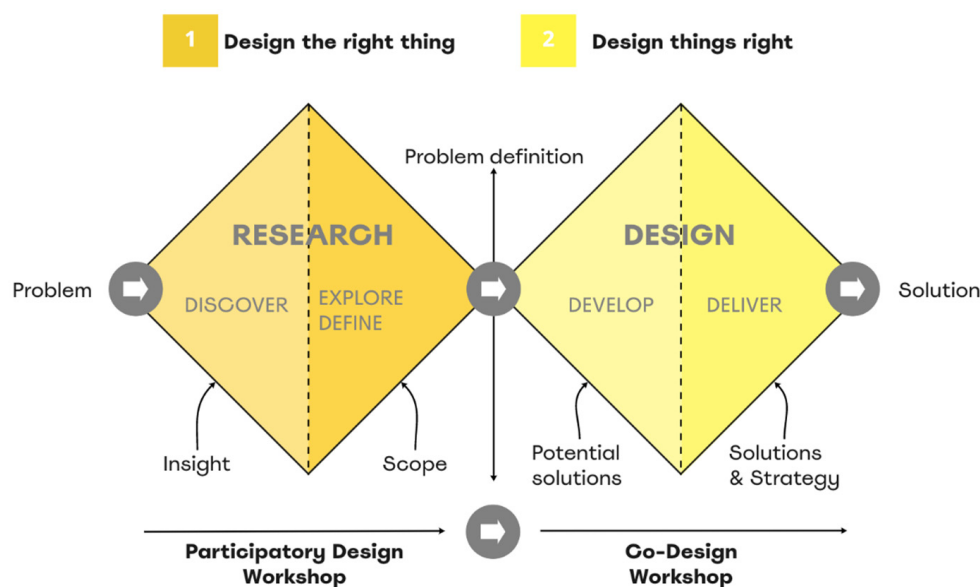
As part of the questionnaire, the researcher included the option to take part in a workshop. This will engage previous respondents in an open forum discussion to gain key insights into how they perceive live streaming in general, their understanding of it and so on. This method is extremely beneficial to this project, as it offers an HCI approach and various methods that enable alternative ideas to be developed, tested, and utilised [87]. These workshops are aimed towards the multiple perspectives we can gain from potential users. The PD workshop will allow stakeholders involved to voice their opinions in the decision-making process through its democratic approach. The key areas that were investigated in this workshop were the following: 1. Allowing participants to familiarise themselves with live streaming from the following three perspectives: the Chinese business model of Taobao, functionality, and usability; 2. Discussing and expressing opinions on how participants perceive the use of live stream commerce; 3. What are their suggestions to push this forward as a method of e-commerce?

### 4.1.3. Participatory Design Workshop

In conjunction with the PD workshops, co-design workshops have been utilised. The purpose of selecting co-design is because this method of practise allows users to become active members and part of the development of an application by allowing them to interact with ideas, the design, and the research team, allowing them to become the designers themselves [87]. This will enable the researcher to draw and gather strategic insights into how potential users want to use an application that involves live stream commerce. The areas that were investigated in this workshop were the following: 1. As a researcher/designer, be with participants to develop and design a live streaming application, inclusive of UX and UI aspects (paper prototypes, i.e., Figma, Miro); 2. Gain observational feedback based on the above (i.e., observing the behavioural and interaction aspects of individual participants) to generate feedback and develop strategic design insights.

### 4.1.4. Workshops: Through a Double Diamond Design Approach

To deliver robust and strategic findings, the double diamond approach was utilised. The double diamond is a framework that helps designers and non-designers tackle complex social, economic, and environmental problems [106]. This approach facilitates an ideal work culture to provide robust and long-lasting positive change (The Design Council [107]). Therefore, by conducting two workshops, the double diamond framework can be utilised more thoroughly and produce in-depth findings, as shown in Figure 5.



**Figure 5.** The double diamond approach, adapted from The Design Council [107], to fit the needs of this research.

### 4.2. Recruitment

The questionnaire was distributed online over a two-week period. In total, there were 87 (40 male and 47 female) respondents, with an age range of 18 to 66+ years old. To ensure the findings were concise and of similar contextual nature, upon completion of the questionnaire, and the respondents were requested to take part in the workshops. In total, there were 10 respondents who were willing to take part (5 males and 5 females). Workshops were conducted online via Microsoft Teams and utilised Miro as tools to demonstrate ideas, opinions, design ideas, and paper prototypes. All 10 participants were involved in both workshops to ensure consistency in results and data collection. The workshops were conducted over a two-day period.



### 4.3. Data Analysis

When it came to the gathered data, there were a total of 87 responses. The data were extracted from Google Forms and transferred into SPSS. The purpose of analysing the data in SPSS is to ensure that there are minimal errors in the statistics. It also enables forecasting and can predict trends quickly without having to be an expert in the software. From the workshops, there was a mixed blend of data, and this consisted of audio, which was transcribed, and written documents (i.e., wireframes, diagrams). The audio data consisted of a total of 180 minutes of audio data and were transcribed in NVivo, which enabled themes to be extracted. When it came to the written documents, they were collated and will be discussed alongside the key themes that arise from the data analysis.

### 4.4. Questionnaire Findings

The questionnaire had the purpose of collecting data that would enable the researchers to understand the preferred methods and behaviour of consumers. Therefore, the below section has been broken down into subsections to discuss the significance of the collected data.

Questions 1 to 3: Demographics. In order to collect a representational demographic understanding of the respondents, the first three questions aimed at extracting gender, age range, and occupation, enabling a more comprehensive understanding around the general background of further data to come in the following questions and enabling us to pin-point whether age range or gender is an influential factor in consumers’ preferred shopping methods and behaviour. Interestingly, there appeared to be a higher number of female respondents (54% of the responses were female, whereas 46% were male). Additionally, most respondents came from higher education or were students (15% for both, 30% combined), as well as administration (13.8%).

Questions 4 to 9: Preferred Methods and Shopping Behaviour. These questions probed into the preferred methods and shopping behaviours of the respondents. It is worth mentioning that these questions were branched for certain responses.

Question 4: What is your preferred method of shopping? Question 6: When did you last use this method? Questionnaire responses suggest that more than half of respondents preferred shopping online (59%), with the majority doing so in the past few weeks, whereas 41% of the remaining respondents preferred shopping on the high street, with the majority having performed so in the past few weeks (see Table 2). This is an interesting finding that the majority preferred shopping online, as this falls in line with what was discussed earlier in the literature review, which discussed how, due to impacting factors such as COVID-19, convenience, and saving time, consumers today prefer to shop online. Therefore, to explore this in more depth and grasp as to why the respondents felt this way, the questionnaire asked why they preferred this method and how satisfying their experience was.

**Table 2.** Preferred shopping methods of respondents, alongside last time of use.

		When Was the Last Time You Shopped through This Method?					
		Today	A Few Days Ago	Last Week	A Few Weeks Ago	A Month Ago	Over a Month Ago
What is your preferred shopping method?	High Street	5	11	8	6	3	3
	Online	9	14	11	14	1	2

Question 5: Why do you prefer this method? This was a branched question in which respondents would answer why they preferred shopping online or on the high street (see Table 3). Questionnaire responses from Question 5 suggested that there were two main reasons why respondents preferred shopping on the high street, with 30% of respondents preferring the high street due to the social aspects of shopping and a further 30% wanting to see physical items. This is a very interesting finding, considering the two core aspects of live stream retailing are that it enhances consumer engagement through various functionalities such as chat functions, following, subscribing, and gifting; also, that with live stream

retailing, consumers are able to see items in real-time, ask questions about them, and see them from a multitude of angles. Therefore, from this point of view, it is very necessary to push forward with the use of live stream retailing to benefit consumers.

**Table 3.** Why do respondents prefer shopping on the highstreet or online?

		Why Do You Prefer Shopping on the High Street or Physically?					
		Convenient	Enjoyable Experience	Interaction	Like to See Physical Items	Social Aspects of Shopping	Try before You Buy
Gender	Female	1	3	2	5	7	3
	Male	2	0	0	6	4	3
		Why Do You Prefer Shopping Online?					
		Convenient	Easier	Enjoyable Experience	More Choice	Saves Time	
Gender	Female	6	2	3	4	11	
	Male	11	0	4	5	5	

Additionally, Question 5 also collected data on why respondents preferred shopping online, in which it was found that 33% preferred doing so due to convenience and a further 31% due to saving time (see Table 3). These findings are in line with previous studies conducted on why consumers prefer shopping online and provide significant insight into how the online presence is going to be carried forward. To investigate this question in more detail, it has been supported by Question 7, as this investigates the influencing factors that may change consumer behaviour.

Question 7: How satisfying was your last shopping experience? In this section of the questionnaire, respondents were provided with a Likert scale question that ranged from very satisfied to very dissatisfied with their last shopping experience (see Table 4). Interestingly, from the data, it is apparent the majority of those who shopped on the high street were very satisfied or somewhat satisfied with their experience. This equated to 66% of respondents for that category. However, on the contrary, the data illustrate that a significant number of respondents who preferred online shopping were somewhat dissatisfied or very dissatisfied. This is a very interesting finding that highlights the potential that there is reasoning behind the satisfaction levels of the two different methods of shopping.

**Table 4.** How satisfied were you with your last shopping experience?

		How Satisfied Were You with Your Last Shopping Experience?				
		Very Satisfied	Somewhat Satisfied	Neither Satisfied Nor Dissatisfied	Somewhat Dissatisfied	Very Dissatisfied
What is your preferred shopping method?	High Street	13	11	4	6	2
	Online	9	9	4	19	10

Questions 8 and 9: What made your shopping experience satisfying or dissatisfying? (See Table 5). The questionnaire responses from Question 8 suggest that most online customers prefer shopping online due to convenience, whereas those who prefer shopping physically prefer to do so for the interaction, product range, and customer service. This is an interesting finding as, in comparison to Question 9, it was apparent that a significant number of online consumers were dissatisfied with the level of customer service they received during their experience. This is a very interesting finding that was discussed by researchers within the literature review, and that online consumers found it difficult to shop online due to the lack of social interaction and customer service, for example, McLean and Osei-Frimpong stated that the customer service function is extremely lacking in online commerce and a there was a severe lack of social interaction leaving customers

unsatisfied [53]. It was also found that chatbots were just an automated service that made no contribution to customer satisfaction and, in fact, decreased it, as customers are looking for empathy, responsiveness, assurance, and reliability [53]. Additionally, when it comes to dissatisfaction with physical retail shopping, Gu et al. and Rao et al. demonstrated that due to COVID-19, the majority of retail stores have implemented restrictions that limit customer satisfaction within stores, which definitely will be an impacting factor in the findings [57,58]. Furthermore, it is worth mentioning that a lot of respondents also highlighted that shopping online was inconvenient, which is an interesting and new finding.

**Table 5.** What made your experience satisfying or dissatisfying?

		What Is Your Preferred Shopping Method?	
		High Street	Online
What made your experience satisfying?	Customer Service	5	2
	Convenience	4	9
	Product range	6	3
	Enjoyable experience	4	3
	Interaction	7	2
	Accessibility	2	2
What made your experience dissatisfying?	Customer Service	3	10
	Inconvenience	2	8
	Product Range	1	2
	Unenjoyable experience	2	4
	Lack of interaction	0	6
	Accessibility	0	0

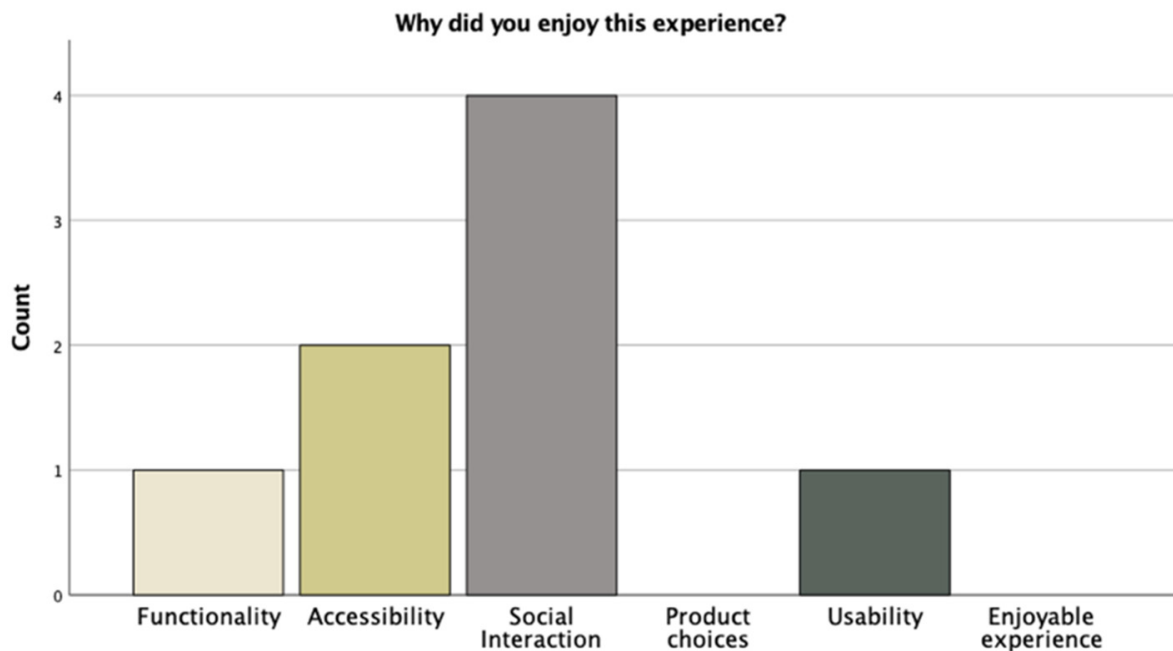
Questions 10 to 13: Live stream insights. In order to build upon the current consumer experience gathered from the above findings, the questionnaire had a further five questions that investigated the current use of live streaming within retail and if any of the respondents were familiar with it at all. Interestingly, the data from the gathered responses to question 10 suggest that 89.7% of respondents had never experienced live stream retailing, which is quite shocking considering the scale of omnichannel marketing within the UK. Additionally, it was found in question 11 that only 19.5% of respondents had heard of live stream retailing before, whereas a massive 80.5% had never heard of it. To delve further into these statistics, the data were cross-referenced with the respondents’ gender and age (see Table 6).

**Table 6.** Data comparison of Question 10 and 11.

			Do You Know What Live Stream Retailing Is?		Have You Ever Experienced Live Stream Retailing?	
			Yes	No	Yes	No
Age	18–25	Female	5	24	5	24
		Male	4	16	2	18
	26–45	Female	6	0	2	4
		Male	1	13	0	14
	46–65	Female	1	5	0	6
		Male	0	5	0	5
	66 and over	Female	0	6	0	6
		Male	0	1	0	1

It is apparent from the above data that have been compared in SPSS, it is apparent that more females were aware of live streaming than males, plus the number of females who experienced it was greater than that of male respondents. This is a very interesting finding, as it appears females from a lower age group (18–25) were more experienced in live stream retailing. Furthermore, between Questions 12 and 13, which probed into whether

the respondents enjoyed this experience and why, it was found that 88% of the respondents enjoyed their experience, with a breakdown of 50% enjoying this experience because of social interaction, 25% as a result of accessibility, 15% as a result of functionality, and a further 15% as a result of usability (see Figure 6).



**Figure 6.** Responses to why respondents enjoyed their experience with live stream retailing.

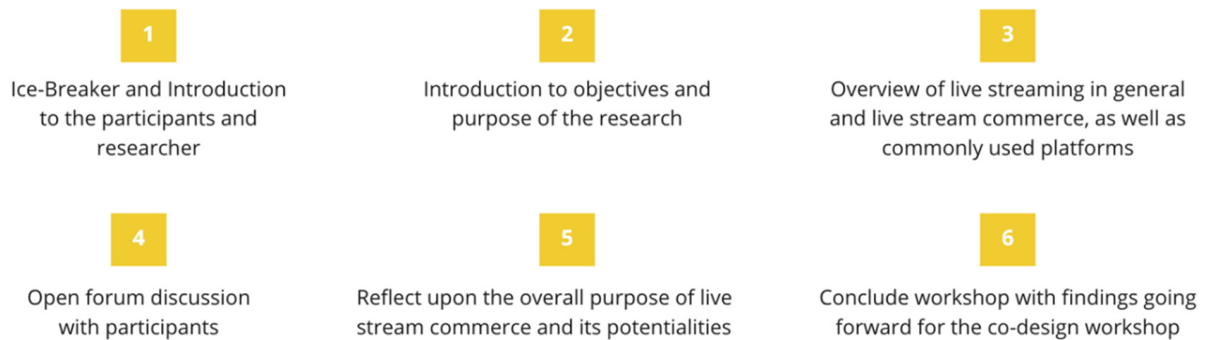
This is an important finding, as it has enabled the researchers to understand why the respondents were happy with their experiences and implement these into future design suggestions. Additionally, reflecting on the earlier literature review, the themes of social interaction, functionality, and usability prevail through the general findings of consumer preferences when it comes to live stream retailing. Question 14: Would you be interested in taking part in an online workshop? When it came to recruiting participants for the workshops, Question 14 requested respondents to leave their email address if they were interested in taking part in the workshops. There were 10 respondents who were interested in taking part. Overall, the data that have been collected from the questionnaire has provided robust findings into the current behaviour and preferred shopping methods of consumers. Most interestingly, it was found that 59% of respondents preferred shopping online, compared to 41% who preferred shopping physically. Furthermore, it was also found that female respondents were more knowledgeable and experienced in live stream retailing, with 88% of them having enjoyed this experience because of the social aspects and interaction it provided.

#### 4.5. Workshop Findings

The overarching aim of the data collection in the workshops was to gather data that would enable the researchers to investigate and generate an outcome for research objective 2. The workshops had the purpose of collecting data that would enable the researchers to understand user perspectives on live streaming and how it should be adopted, who should use it, and what functionality it should include. The data were analysed through a thematic analysis approach, which is one of the most common forms of analysis in qualitative research—it places importance on examining data and highlighting themes within that data [108,109]. To draw out the key themes from the findings, Braun and Clarke’s five-phase approach was utilised, which facilitated the production of insightful themes that were then refined to establish robust findings.

#### 4.5.1. Participatory Design Workshop

In line with the double diamond method, the purpose of this workshop was to involve participants in the decision-making process of how society should adapt live stream retailing and how it is useful. Additionally, this will also involve participants in the democratic decision making of where it can be adopted, how it should be adopted and create discussions around why. The workshop was broken down into six stages (see Figure 7).



**Figure 7.** The six stages of the Participatory Design Workshop.

Participants came from various demographical backgrounds, including students, designers, higher education, government, finance, administration, retail, or retired with an age range of 20–67 years old. Participants' names were coded, for example, 'PD4' to ensure anonymity and confidentiality. The workshop lasted 90 minutes, and data were collected on a Miro board. The session was recorded with participant consent so the researchers could take further observational notes and transcribe the commentary.

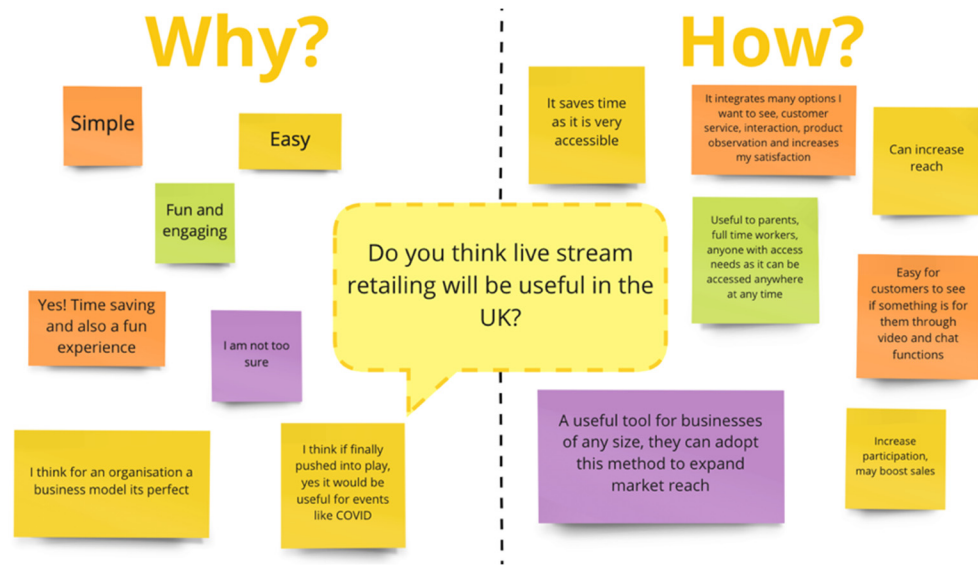
#### 4.5.2. PD Workshop Findings: Discover, Explore and Define

Based on the discussions, there were multiple viewpoints given from the participants' perspectives and experiences.

**Theme 1: The impacts of COVID-19.** Firstly, workshop participants drew attention to COVID-19 and how this has economically damaged the high street. For example, PD6, who works in retail, gave the following interesting perspective on their perception of live streaming: *'As someone who has seen the impacts of the pandemic, I have experienced furlough and loss of work. I was worried at the thought of live streaming retailing but looking at its capabilities I think all retailers should use this and use the existing man hours they have to reach customers'*. This is an important finding, especially as those in retailing understand what impacts a pandemic has had and how live streaming can facilitate the customers lost while keeping stores open and retaining what little footfall it may have, but instead, shifting manhours into live streaming so at no point will staff be idle.

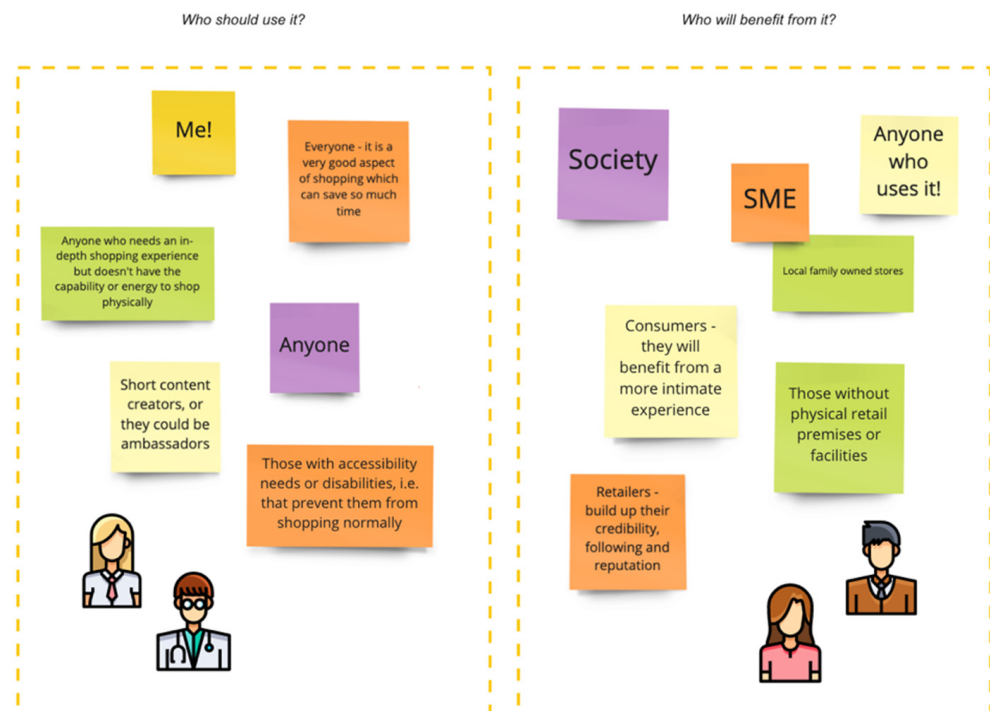
**Theme 2: Business model potential.** Secondly, participants discussed why and how they found live stream retailing useful. Key findings were written on sticky notes and placed on a Miro board (see Figure 8). It was discussed that live streaming appears to be the most beneficial business model to adopt at this moment in time. This was discussed by PD as follows: *'I think for any business that a live stream retailing may be an innovation that will be popular. Not only could it save on space, but it is extremely beneficial to family-owned business or SME's!'* This perspective mirrors that of the aforementioned quote from PD6, and it is extremely insightful to see different perspectives merge, giving a positive outlook on live stream retailing.





**Figure 8.** A screenshot from the Participatory Design workshop Miro board, illustrating why and how live stream retailing is useful.

Theme 3: Targeting the correct areas. Thirdly, participants discussed who should use live streaming retailing and who will benefit from it. These insights provided an understanding of how such a platform should be developed, who it should be aimed at and define what sort of features and requirements it should have (see Figure 9).



**Figure 9.** A screenshot from the Participatory Design Workshop Miro board, illustrating who should use live stream retailing and who would benefit from it.

There were some discussions around the topic of aiming such a method to smaller businesses. Additionally, it was highlighted that not only would this benefit business owners but also us as a society, mentioned by PD2 as follows: *'This approach to retailing is like telesales, however it has much more an impact on my satisfaction levels. During the past I have struggled purchasing products while being satisfied and shopping in store become not only a challenge but impossible. Which is why I think live streaming would benefit us as a society as its engaging, it gains our attention and in the end we will be satisfied from not only the product but the experience'*.

From the PD workshop, participants discussed how live stream retailing should be utilised. The key findings from this stage were that it should be used in one or more of the following:

1. *'As a plug-in to existing retail platforms to provide a more detailed and diverse presentation of products and customer journeys, while also supporting smaller retailers in becoming more flexible in their business'*.

This is a crucial finding; the discussion of a 'plug-in' is a very fitting perspective on how live streaming could be adopted into an already existing business model. This idea of integrated innovation in entertainment in retail is a complete paradigm shift for the industry, likewise to how omnichannel marketing was over two decades ago.

2. *'To increase accessibility and inclusivity of retail shopping from a disability, psychological, and preference point of view'*

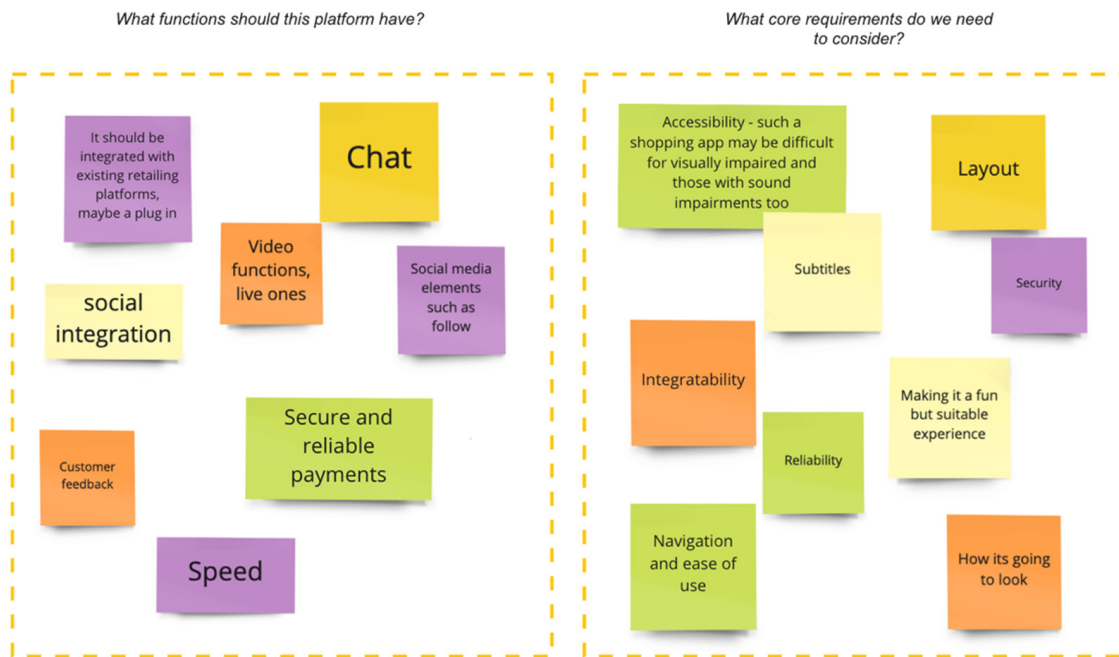
Increasing the accessibility and inclusivity of daily discourse is an area of importance and a constantly changing dimension of how we, as researchers and designers, can facilitate an experience for users. With the adoption of live stream retailing, shopping can be made into a convenience for those with impairments, disabilities, and so on.

3. *'Facilitating sustainability'*

This finding is one that is crucial in general, not just from the COVID-19 perspective but also from an economic perspective. In recent years, brick-and-mortar stores have been declining. This is not only a brick-and-mortar store issue, but it is also an online presence and omnichannel marketing issue. However, a live streaming platform has demonstrated consumer reach in China not only for struggling retailers but also for others. Therefore, live stream retailing may facilitate the sustainability of businesses by ensuring they can reach further than their traditional brick-and-mortar stores could.

Overall, the workshop provided insight into the perceptions, recommendations, and future of live stream retailing. However, a key element to the success of such a platform comes with interaction, functionality, and system requirements. When interacting, participants reflected on their experiences with Taobao Live, Twitch, and Amazon live. Some of the reflections were that Taobao lacked the option of language interchangeability, while the interaction of the platform and the navigation were of high quality. However, experiences with Amazon Live presented challenges to the participants, as they found it difficult to navigate and clunky, and while they understood the language, the interaction and experience lacked. Participants found Twitch to be the most user-friendly in terms of interaction, and they generated recommendations on what functions and requirements a live stream platform should have to facilitate smooth interaction (see Figure 10).

Overall, the insights and findings gained from the workshop were extremely beneficial for further understanding how potential users of live stream retailing, but more importantly, as citizens from our population understand it from their perspective and how they perceive it, what are their thoughts, how they think it should be used, and who should use it.



**Figure 10.** A screenshot from the Participatory Design Workshop Miro board, illustrating what core functions and requirements a live stream commerce platform should facilitate for its users.

#### 4.5.3. Co-Design Workshop

The overarching purpose of this workshop was to involve participants into the design and functionality of the prototype. This workshop will enable the researchers to develop strategic recommendations. Building upon the previous workshop, participants were now familiar with live stream retailing. Therefore, in line with the earlier mentioned double diamond approach, the purpose of this workshop is to develop potential solutions and suggestions, thus the workshop was orchestrated through the following three activities: (1) Map out, discuss and understand the customer journey, through journey mapping; (2) Develop design ideas and suggestions of potential user interface and interaction; (3) Reflect upon iterations made on the paper prototypes and discuss potential change or additions.

#### 4.5.4. Co-Design Workshop Findings: Develop and Deliver

The first stage of the workshop was to generate a user journey map to illustrate a visual story of the customer journey when interacting with this potential innovation to ensure a successful and satisfying experience/interaction [91]. This has been illustrated in Figure 11. This step was crucial and provided a detailed understanding of the customer journey. It was interesting to see the topics of satisfaction, social interaction, and purchase intention arise multiple times.

Secondly, the workshop focused on developing the application suggestions. The participants were presented with post-it notes and utilised Miro to create user interfaces to build their ideal user interface (see Figure 12). The findings from this were interesting considering the participants were all, except one, from non-design backgrounds; however, they knew their preferences as a user and what functionality they wanted. For example, PD4 highlighted that they like the idea of a plug-in application rather than a new application, as follows: *'I think it would be an amazing addition to existing applications, in which businesses could add to the marketing and sales approach as I would much prefer some sort of plug-in over an additional application'*.

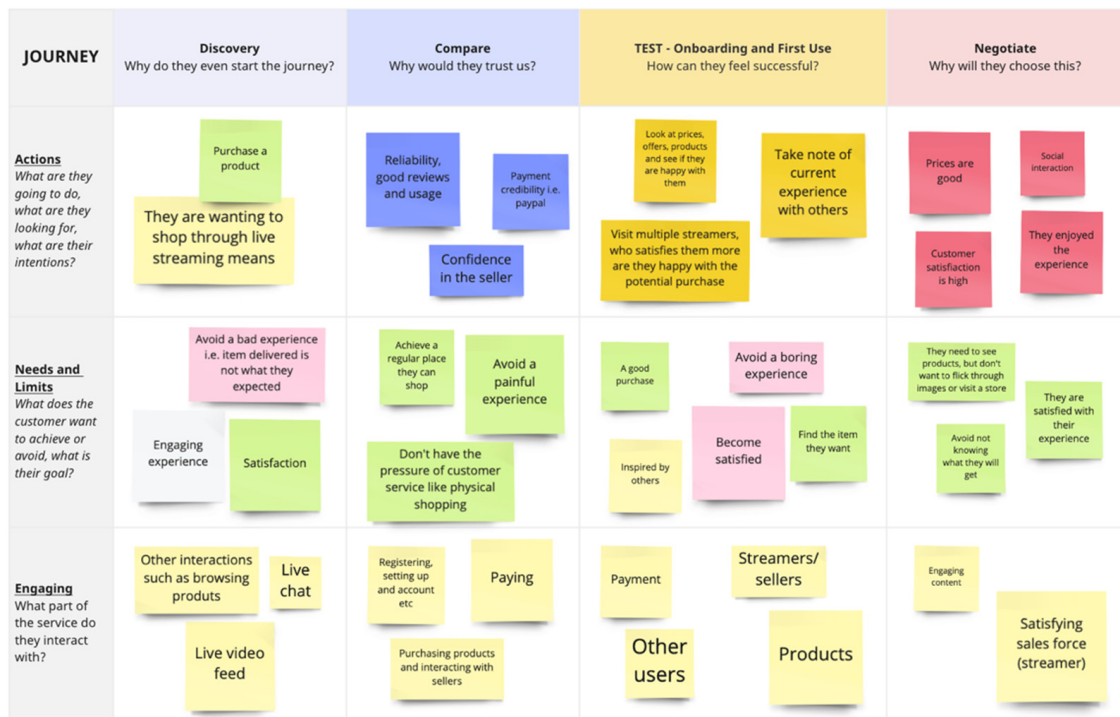


Figure 11. A screenshot from the Co-design Workshop Miro board, illustrating a customer journey map.

### Wire Framing: Application suggestions

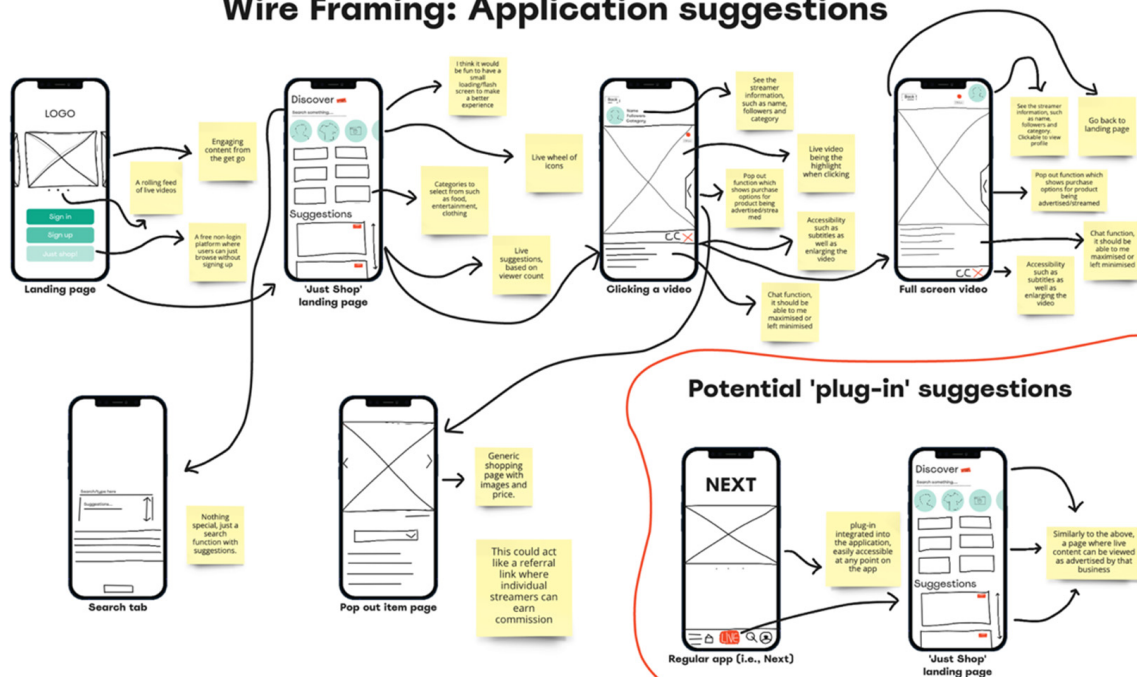
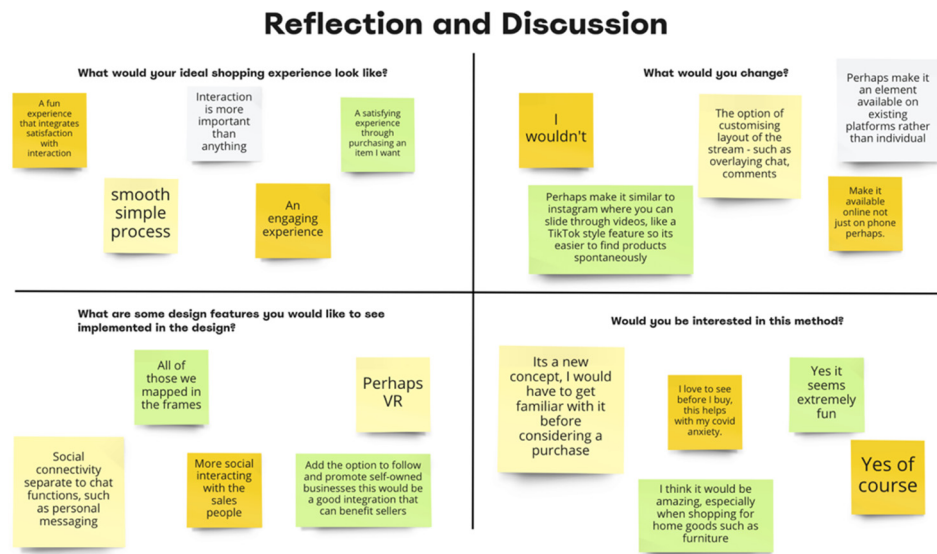


Figure 12. A screenshot from the Co-Design Workshop Miro board, illustrating wire frame/prototype suggestions developed by the participants.

This was an interesting finding that not only complemented the opportunity of live stream retailing but also generated further design strategies on how this may look if developed. Additionally, PD3, a designer, commented on the functionality and importance of interaction, highlighting that having an easily understandable interface was crucial as follows: *'This method of interacting is fun, but at the end of the day we still want to make a purchase*

and become satisfied, the idea of integrating purchase options in the application is quite important therefore that element of interacting is needed’.

Understanding this perspective from the participants highlights the importance of having an integrated experience that combines interaction and experience with satisfaction. Therefore, it is imperative that in the design suggestions, this is considered, and a prototype is built off of those three characteristics. Taking this into account, the final stage of the workshop was to reflect upon the generated low-fidelity wireframes and discuss four key areas that will be insightful for the final discussion of this research project and design suggestions (see Figure 13).



**Figure 13.** A screenshot from the Co-Design Workshop Miro board, illustrating participants reflection and discussion.

From the reflection and discussion, there were four key areas. Firstly, participants reflected upon what their ideal shopping experience would look like. Aspects such as ‘an experience integrating satisfaction with interaction’, ‘smooth process’, and ‘engaging experience’ came up in the discussion, which was similar to that in the findings from the earlier questionnaire. This is helpful to see the similarity in the findings as it provides insight into what a larger population hopes to see when it comes to live stream retailing. Secondly, participants discussed what they would change with the design, and it was highlighted that, again, this method of commerce may work better as a plug-in rather than a separate platform, and also that it has a similar style to Tik-Tok, in which we see a feed of videos following on from each other rather than selecting different categories, which may arouse customer purchase intention more spontaneously and strategically. Thirdly, participants went on to discuss some design features they would like to see in the design, and these included VR, social functions such as chat, and also the option for businesses to gain followings, through which they could build up a customer base online.

Overall, the findings from the co-design workshop have provided in-depth insight into strategic application recommendations when it comes to a design that can be implemented to enhance success and various insights into what their feelings are about such a platform, what their ideal experience would be, and how they think the customer journey can be mapped out and understood from a user perspective.

### 5. Discussion and Recommendations

The findings from this study have provided strong evidence regarding answering the overarching question of this study. In answer to this, four key discussion points have been outlined below.



### 5.1. Interaction and Engagement in Live Stream Commerce Technology

A key aspect within the findings was that interaction and engagement were key elements to the success of live stream commerce and one of the main motivations for using it. For example, it was highlighted by participants that social interaction was a major element that would enhance their shopping experience; this could be through the implementing a live chat or through being able to speak with the business in real-time.

On the other hand, when it came to engagement, there was a demand for more engagement in the shopping experience through, again, chat functions but also through the existing live stream elements that are implemented in the likes of Twitch or Taobao live, and that is following, subscribing, and sending gifts to the streamer, which has already proven successful in live streaming [61]. This approach would be beneficial in retail and could enhance the sell-through of products. For example, a consumer could follow or subscribe to a particular item and add it to their favourites/basket, in which they could potentially sign up for updates on that product (i.e., when it will be featured live) so they have the opportunity to see and ask questions about a product that is likely to encourage purchase intention.

Additionally, it is important to understand how live stream commerce can enhance the online shopping experience for those with visual and audio impairments. For example, while screen-readers and magnifying software already exist, live stream commerce could potentially facilitate the enhancement of an experience and satisfaction by being able to talk about the colour, feeling, texture, and fit of a product, as well as help in the colour matching and outfit building of someone who may often struggle. This area was discussed in the workshops and is a current gap within research that needs to be expanded upon by looking into how a tangible interface and online experience can facilitate those with visual impairments to simplify their experience.

### 5.2. Integrated Innovation: How Live Stream Commerce Can Enhance Business Sustainability

The majority of respondents expressed that they preferred shopping online. Additionally, the data collected from the workshops identified a trend regarding how consumers wanted the experience of live stream commerce to be integrated into their shopping experience, and this was through the approach of a 'plug-in'. Rather than generating a new platform, it was mentioned that businesses should adapt to facilitate live stream commerce and utilise this as a strategy for their existing business to gain the attention of new consumers and retain those who abandon their intended purchase through a method of increasing satisfaction.

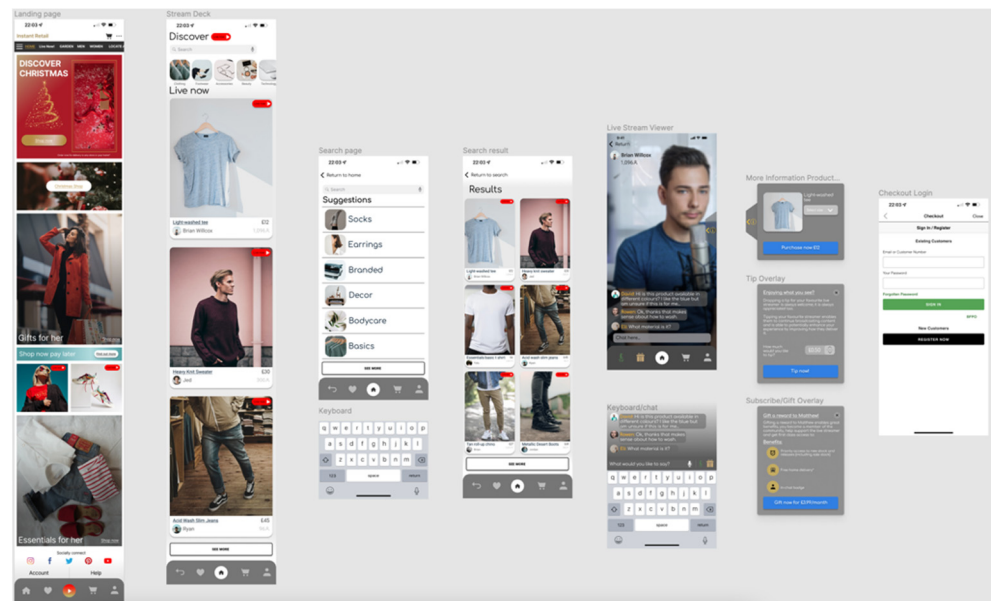
A further crucial finding regarding how to enhance business sustainability through live stream commerce was that most questionnaire respondents preferred shopping online due to convenience, saving time, and a broader range of choices. However, it was highlighted that they were not very satisfied with shopping online due to the limitations and almost no presence of customer service. Yet, with live streaming, consumers would be able to communicate in real-time to facilitate their needs at the point of sale, rather than waiting a few days for an online delivery to be unsatisfied. This is an area that needs to be strengthened in e-commerce, as it has been discussed in a survey by a British multinational universal bank, Barclays, that 33% of consumers deliberately over-purchased products and returned them [110]. In the same survey, it was also highlighted that 57% of retailers confessed that these returns posed a negative impact on their day-to-day operations [110]. These findings within the survey clearly demonstrate that e-commerce poses a threat to retailers and an inconvenience to consumers in the fact that they purchase items they do not need and return them, and that businesses lose out on man-hours and incur additional costs that are unnecessary.

Therefore, if live stream commerce did become an integration within a business model, this could bring about the minimisation of product returns, which would also work in line with the Sustainable Development Goals (i.e., SDG 11 Sustainable Cities and Communities; SDG13 Climate Action) and also corporate social responsibility (environmental

sustainability) within a business's operations, as it will contribute to a potential decrease in carbon footprint as it minimises logistics and also helps a business retain man-hours lost in unnecessary operations.

### 5.3. Design Strategies and Suggestions in the Development of a Live Stream Commerce 'Plug-in'

From the workshops, participants mentioned that they would like to see a platform that enables them to shop with ease, interactively, and accessibly. As shown earlier in the workshops, paper prototypes were generated, which highlighted that a plug-in would be a crucial adaptation that is very necessary to the future of e-commerce businesses going forward. Therefore, the researchers developed an application prototype and user interface that was based on the low-fidelity mock-ups generated in the co-design workshop (see Figure 14).



**Figure 14.** A screenshot from the high-fidelity mock-ups of a live stream commerce 'plug-in' generated from the Participatory and Co-design workshops, in Figma.

The above figure outlines the basic structure of what a plug-in could look like on an existing e-commerce application. The researchers took the suggestions from the workshops developed by the participants to ensure a swift user experience. The benefits of this integration are that while shopping consumers will be able to browse as they usually would but experience an additional interaction through live stream retailing, where they can browse products being demonstrated in real-time.

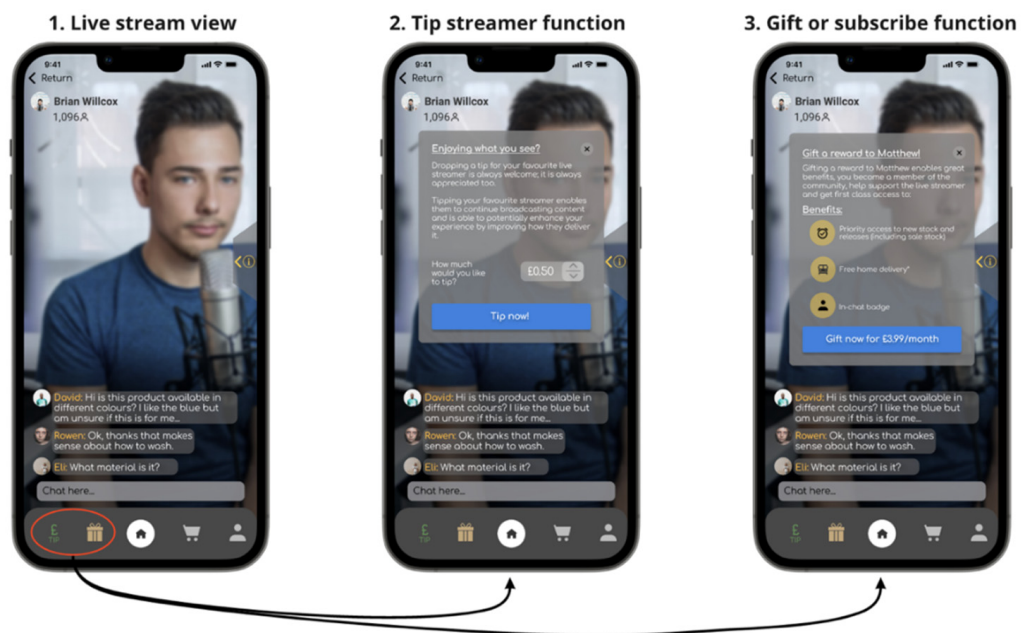
This method of retailing can enhance the social interaction of the customer journey and help overcome barriers such as social exclusion, lack of communication, and the delivery of unsatisfying products. For example, users of the live stream integration can utilise the chat to ask questions about a specific product, such as what the material is, how to wash it correctly, and so on, as well as click on an 'i' icon for more information, which will present information over-lay where a purchase can be made from (see Figure 15).

This integration may increase customer satisfaction due to customers' getting to know more information instantly, rather than waiting for a product to arrive and becoming disappointed. This was a key area discussed by the participants, as they often found when shopping online that it was difficult to communicate with customer service. They expressed frustration with that experience, thus the integration of a chat function into the live stream itself became highly desirable and an essential element the participants demanded.



**Figure 15.** A high-fidelity mock-up of a live stream commerce ‘plug-in’ generated from the Participatory and Co-design workshops, demonstrating chat functions, in Figma.

Furthermore, from the data collection stage of this research, it was found that following, subscribing, and gifting functions were highly desirable by the participants, which was also demonstrated in their low-fidelity paper prototypes. As a result of this desire, the integration of a live stream application includes gifting, tipping, and following, as shown in Figure 16. Not only were these key elements discussed by the participants, but they were discussed by many researchers in the earlier literature review and coincide with successful elements of current live stream platforms. These elements have been proven and discussed by many researchers to be successful in the enhancement of satisfaction and engagement, creating an interactive social space for consumers [61].



**Figure 16.** A high-fidelity mock-up of a live stream commerce ‘plug-in’ generated from the Participatory and Co-design workshops, demonstrating various in-chat functions, in Figma.

On the other hand, the prototype suggestion facilitates compatibility and work as a plug-in or be adapted to fit the needs of any business. This was an important element of the design, as participants wanted to develop an idea that could be easily compatible rather than introduce a brand-new platform. Hence, compatibility is also extremely necessary as it enables both an existing platform and this new integration to work together without having to be altered in any way.

#### *5.4. Live Stream Commerce as an Open Business Model*

With the rapid development of technology and how this is impacting society, approaches to business transactions are shifting faster than ever, and, as a result of this, innovative approaches and business model transformation are absolutely imperative in upholding competitive advantage within the market [111–113]. As stated by researchers Grabowska and Saniuk, a business's aspiration to achieve success requires close monitoring with regard to its strategy implementation [114]. Therefore, it is crucial to adopt new technological approaches, such as live stream commerce, through an open business model approach and ensure transparency in its business exchanges and services—similarly to that of Alibaba, which implemented an open business model and skyrocketed in consumer retention and profit [114]. As demonstrated in the findings of this research, live stream commerce poses multiple benefits when it comes to enhancing business sustainability through devices that consumers use on a daily basis, which impacts both profits within a business and the environment hand in hand. Thus, posing a strategic open business model that is robust in its approach by sustainability utilising existing technology, space, and resources, while also enabling smaller, new, or family-owned businesses to benefit from a business model that requires no immediate start-up costs and essentially becomes self-sufficient over time [115–118]. To add to this, referring back to the case of Alibaba, the major company seized an immense scale of opportunity by embedding an open innovation strategy into its operations and by creating a self-sustaining business model, creating business growth and ongoing success within the Chinese economy [119].

With this in mind, it is apparent that this research and its findings are of value to the potential propositions of upcoming businesses who want to adopt such a business model in the early stages of development by creating and focusing on open service and ensuring that the business is run for the benefit of all and not just an individual.

## **6. Conclusions**

In this research project, the researchers outlined four research objectives that were to be achieved throughout. These objectives were met throughout this research and have contributed significantly to the research question. These have been outlined in the section.

### *6.1. Live Stream Commerce and Open Innovation*

Firstly, the researchers critically analysed how live streaming was currently being utilised to support online retailing. This was proven a success, mainly in Asia, through the likes of Alibaba. Additionally, it also delved into the topic of customer satisfaction and how this could be met through live streaming, and it was evidenced in the literature and later supported by the findings that it was met through social interaction, customer service, engagement, and experience. Therefore, the first objective has been achieved in understanding how live streaming is currently utilised in supporting online retailing.

Secondly, in response to critically evaluating the online shopping experiences of British customers, the researchers conducted a questionnaire to understand how customers currently preferred shopping methods and investigated why and how their experiences were satisfying or unsatisfying. On top of this, workshops were conducted to further engage participants in sharing their experiences about how they wanted to experience live stream commerce and what elements they would like to be part of that experience. From this, research objective two was achieved.



Thirdly, from the insight gained from the data, strategic design recommendations were made through the generation of a live stream commerce plug-in that is compatible with any business model. Additionally, the plug-in facilitated the suggestions that the participants from the workshops outlined, as they were the key users.

Finally, leading back to the research question, this project has addressed this incredibly. This is since strategic recommendations were gained from the research, providing insight into what we can learn from the successful case of Chinese live stream-based retailing, and we have gained in-depth findings from prospective users and insight into how we can transfer this method of commerce. Thus, the introduction of four key areas of discussion was the following: 1. Interaction and Engagement in Live Stream Technology; 2. Integrated Innovation: How Live Stream Commerce can enhance Business Sustainability; 3. Design Strategies and Suggestions in the Development of a Live Stream Commerce Plug-in; 4. Ethics and Limitations. Therefore, this provided the research with a hypothesis that Western society has many aspects to learn from the successful case of live stream commerce from its adoption in Asia. From this hypothesis, the researcher was able to build up strategic recommendations and design insights into how live stream commerce can be adopted to enhance and transform how technology is used in the traditional British retailing sector.

To conclude, there has been a significant contribution to the area of e-commerce and how it can be enhanced through the utilisation of innovation that is paving its way to success in countries such as China. Although this integration poses a massive paradigm shift in the way we behave when shopping, this method of integrated innovation is an approach that is most beneficial to the businesses at stake and ensures that consumers can have a swift shopping experience.

## 6.2. Ethics and Limitations

From the earlier literature review and discussion, the topic of ethics came up numerous times, specifically around the areas of credibility, consistency of a reliable business, and censorship. In any business model, platform, or application design and its adoption, ethical considerations are an imperative aspect that must be highly regarded.

Firstly, having a credible source of information from an influencer/streamer was a key discussion point in the earlier workshops. Participants mentioned they would often only purchase products from retailers they were confident with, as they were too afraid to purchase from a small or family-owned business or a platform on which they had never used before. This was due to the lack of credibility around product quality, customer service and returns policy. However, it was found that they would be happy to purchase products from well-known influences such as Kim Kardashian, for example, as they are confident in their social presence and followership. Yet, in recent times, a big following does not often reflect an influencer's creditability, such as the case of Asia's live stream queen, Viya, who was recently charged with tax evasion due to falsely reporting the commission income she earned on platforms such as Alibaba's Taobao live [120]. Her presence on China's mainstream platforms has been removed for abusing the followership and position she gained [120]. This factor is crucial to the success of live stream commerce, and having trust is an imperative aspect that consumers find necessary when purchasing products, and of course, it is essential when proposing an ethical business model.

Secondly, ensuring that a business is consistent and has robust policies when it comes to usage, purchasing, returning, and reliability is imperative [121,122]. Therefore, the introduction of a plug-in rather than a new platform is extremely beneficial to existing businesses as they can continue to use the same approach they already do with their payment and returns policy. Additionally, since consumers can communicate directly with streamers while watching live content, the potential for miscommunication or misunderstandings may be minimised.

Thirdly, another consideration that needs to be considered is censorship. In recent times, the online media has acted as a magnet for hateful and sensitive comments. The topic of censorship was discussed by participants in the workshops, and they had some worries



about live streams being an area where this can be facilitated. For example, in recent times, the global gaming live stream platform Twitch saw an increase in bot-like accounts that spammed streamers' chats with hate and abusive comments [121]. In response to this, Twitch launched an update that detects such comments or 'hate speech'. However, was unable to roll this out in time and the damage had already taken place. On top of this, a lot of streamers' personal information was spewed out on various platforms due to them trying to avoid said comments by blocking such bots [121]. As a result of this, streamers boycotted the platform and requested Twitch 'do better' and the hashtag 'ADayOffTwitch' trended worldwide. Hence, ensuring the censorship of such hateful and abusive comments, content, or materials is of great importance when introducing a new platform or plug-in, and this must be considered in the adoption of it.

Finally, the idea of a new platform may pose a threat to existing businesses, and they may feel worried about their viability. However, as a business model integration, this 'plug-in' can fill the lull periods the retail sector experiences and transform the quiet periods into an 'live online commerce' period where sales consultants can promote products online to retain their hours but also benefit from the above proposal when it comes to gifting/subscriptions. This method may benefit the business by reaching a larger audience than it would in quiet periods, and unlike a lot of technological or automation advancements, which see the loss of 'real' man-hours, this should not see any loss as quiet periods will be reflected in live streaming.

On top of this, such a technological development can aid and facilitate the creation of small businesses and help them do so with greater depth and reach a target market easier than it would take if they were trying to break entry into the high street.

**Author Contributions:** Conceptualization, K.M. and S.Z.; Methodology, K.M. and S.Z.; Software, K.M.; Validation, K.M.; Formal Analysis, K.M.; Investigation, K.M.; Resources, K.M. and S.Z.; Data Curation, K.M.; Writing-Original Draft Preparation, K.M.; Writing-Review & Editing, S.Z.; Visualization, K.M.; Funding Acquisition, S.Z. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Not applicable.

**Conflicts of Interest:** The authors declare no conflict of interest.

## References

1. Foroudi, P.; Gupta, S.; Sivarajah, U.; Broderick, A. Investigating the effects of smart technology on customer dynamics and customer experience. *Comput. Hum. Behav.* **2017**, *80*, 271–282. [CrossRef]
2. Lu, Z.; Xia, H.; Heo, S.; Wigdor, D. You Watch, You Give, and You Engage. In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems, Montreal, QC, Canada, 21–26 April 2018; pp. 1–13.
3. Tang, J.; Venolia, G.; Inkpen, K. Meerkat and Periscope. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems, San Jose, CA, USA, 7–12 May 2016. [CrossRef]
4. Haimson, O.; Tang, J. What Makes Live Events Engaging on Facebook Live, Periscope, and Snapchat. In Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems, Denver, CO, USA, 6–11 May 2017. [CrossRef]
5. Wang, Y.; Lu, Z.; Cao, P.; Chu, J.; Wang, H.; Wattenhofer, R. How Live Streaming Changes Shopping Decisions in E-commerce: A Study of Live Streaming Commerce. *SSRN Electron. J.* **2021**, 1–25. Available online: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3874121#](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3874121#) (accessed on 5 September 2021). [CrossRef]
6. McKinsey & Company. It's Showtime! How Live Commerce Is Transforming the Shopping Experience. 2021. Available online: <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/its-showtime-how-live-commerce-is-transforming-the-shopping-experience> (accessed on 5 September 2021).
7. George, M. Livestream Shopping Is the Next Big Thing in Retail. *Fortune*. 2020. Available online: <https://fortune.com/2021/01/07/livestream-video-shopping-hsn-qvc/> (accessed on 5 September 2021).
8. Sun, Y.; Shao, X.; Li, X.; Guo, Y.; Nie, K. How live streaming influences purchase intentions in social commerce: An IT affordance perspective. *Electron. Commer. Res. Appl.* **2019**, *37*, 100886. [CrossRef]

9. Liu, X.; Yuan, Y.; He, J.; Li, Z. Framing the Travel Livestreaming in China: A New Star Rising under the COVID-19. *Curr. Issues Tour.* **2022**, 1–20. [CrossRef]
10. Grafton-Clarke, C.; Uraiby, H.; Abraham, S.; Kirtley, J.; Xu, G.; McCarthy, M. Live Streaming To Sustain Clinical Learning. *Clin. Teach.* **2022**. [CrossRef]
11. Chen, S.; Lamberti, L. Multichannel marketing: The operational construct and firms' motivation to adopt. *J. Strateg. Mark.* **2016**, *24*, 594–616. [CrossRef]
12. Merritt, K.; Zhao, S. An Investigation of What Factors Determine the Way in Which Customer Satisfaction Is Increased through Omni-Channel Marketing in Retail. *Adm. Sci.* **2020**, *10*, 85. [CrossRef]
13. Office for National Statistics. Internet Users, UK: 2020. Available online: <https://www.ons.gov.uk/businessindustryandtrade/itandinternetindustry/bulletins/internetusers/2020> (accessed on 5 September 2021).
14. Roggeveen, A.; Sethuraman, R. How the COVID-19 Pandemic May Change the World of Retailing. *J. Retail.* **2020**, *96*, 169–171. [CrossRef]
15. Hoehe, M.; Thibaut, F. Going digital: How technology use may influence human brains and behaviour. *Dialogues Clin. Neurosci.* **2020**, *22*, 93–97. [CrossRef]
16. Dodgson, M.; Gann, D.; Salter, A. The Role of Technology in the Shift towards Open Innovation: The Case of Procter & Gamble. *R D Manag.* **2006**, *36*, 333–346.
17. Schepis, D.; Purchase, S.; Butler, B. Facilitating Open Innovation Processes through Network Orchestration Mechanisms. *Ind. Mark. Manag.* **2021**, *93*, 270–280. [CrossRef]
18. Bereznoy, A.; Meissner, D.; Scutto, V. The Intertwining of Knowledge Sharing and Creation in the Digital Platform Based Ecosystem. A Conceptual Study on the Lens of the Open Innovation Approach. *J. Knowl. Manag.* **2021**, *25*, 2022–2042. [CrossRef]
19. Bialik, Kristen, and Richard Fry. How Millennials Compare with Prior Generations. 2019. Available online: <https://www.pewsocialtrends.org/essay/millennial-life-how-young-adulthood-today-compares-with-prior-generations/> (accessed on 4 August 2019).
20. Statista. How Many Hours in a Typical Week Would You Say You Use the Internet? 2021. Available online: <https://www.statista.com/statistics/300201/hours-of-internet-use-per-week-per-person-in-the-uk/> (accessed on 12 September 2021).
21. Li, C.; Miroso, M.; Bremer, P. Review of Online Food Delivery Platforms and their Impacts on Sustainability. *Sustainability* **2020**, *12*, 5528. [CrossRef]
22. Wood, Z. Online Shopping Makes Many High Street Jobs Unviable, Says Next Boss. *The Guardian*. 2020. Available online: <https://www.theguardian.com/business/2020/sep/25/online-shopping-makes-many-high-street-jobs-unviable-say-next-boss> (accessed on 30 September 2021).
23. Statista. Number of Daily Active Users (DAU) of Microsoft Teams Worldwide as of April 2021. Available online: <https://www.statista.com/statistics/1033742/world-wide-microsoft-teams-daily-and-monthly-users/> (accessed on 11 September 2021).
24. Bloomberg. The Hybrid Work Revolution Is Already Transforming Economies. 2021. Available online: <https://www.bloomberg.com/news/features/2021-08-26/will-remote-work-become-the-norm-hybrid-offices-are-transforming-economies> (accessed on 23 September 2021).
25. Zimmer, F. A Content Analysis of Social Live Streaming Services. In *Social Computing and Social Media; User Experience and Behavior. Lecture Notes in Computer Science*; Springer: Cham, Germany, 2018; Volume 10913, pp. 400–414. Available online: [https://www.researchgate.net/publication/325460357\\_A\\_Content\\_Analysis\\_of\\_Social\\_Live\\_Streaming\\_Services](https://www.researchgate.net/publication/325460357_A_Content_Analysis_of_Social_Live_Streaming_Services) (accessed on 31 October 2021).
26. Statista. Total Hours Watched Across Leading Live Streaming Platforms as of 4th Quarter 2020 (In Billions). 2021. Available online: <https://www.statista.com/statistics/1264246/quarterly-live-streaming-hours-watched/> (accessed on 11 September 2021).
27. Larson, K. Retailers Embrace Livestreaming, Market Expected to Reach \$11 Billion in 2021. *Forbes*. Available online: <https://www.forbes.com/sites/kristinlarson/2021/03/27/retailers-embrace-livestreaming-market-expected-to-reach-11-billion-in-2021/?sh=6b8d5be22fde> (accessed on 30 September 2021).
28. Li, Y.; Wang, C.; Liu, J. A Systematic Review of Literature on User Behavior in Video Game Live Streaming. *Int. J. Environ. Res. Public Health* **2020**, *17*, 3328. [CrossRef] [PubMed]
29. Lu, Z. Understanding and Supporting Live Streaming in Non-gaming Contexts. 2021. Available online: <https://tspace.library.utoronto.ca/handle/1807/106291> (accessed on 26 September 2021).
30. Bründl, S.; Hess, T. Why do Users Broadcast? Examining Individual Motives and Social Capital on Social Live Streaming Platforms. In Proceedings of the 20th Pacific Asia Conference on Information Systems (PACIS 2016), Chiayi, Taiwan, 1–27 July 2016.
31. Scheibe, K.; Fietkiewicz, K.; Stock, W. Information Behavior on Social Live Streaming Services. *J. Inf. Sci. Theory Pract.* **2016**, *4*, 6–20. Available online: <http://koreascience.or.kr/article/JAKO201618764100936.page> (accessed on 28 August 2021). [CrossRef]
32. Wang, M.; Li, D. What Motivates Audience Comments on Live Streaming Platforms? *PLoS ONE* **2020**, *15*, e0231255. [CrossRef] [PubMed]
33. Cisco. Cisco Annual Internet Report (2018–2023) White Paper. 2021. Available online: <https://www.cisco.com/c/en/us/solutions/collateral/executive-perspectives/annual-internet-report/white-paper-c11-741490.html> (accessed on 29 September 2021).
34. Cai, J.; Wohn, D. Live Streaming Commerce: Uses and Gratifications Approach to Understanding Consumers' Motivations. In Proceedings of the 52nd Hawaii International Conference on System Sciences, Maui, HI, USA, 11 January 2019. Available

- online: [https://www.researchgate.net/publication/331024408\\_Live\\_Streaming\\_Commerce\\_Uses\\_and\\_Gratifications\\_Approach\\_to\\_Understanding\\_Consumers\T1\textquoteright\\_Motivations](https://www.researchgate.net/publication/331024408_Live_Streaming_Commerce_Uses_and_Gratifications_Approach_to_Understanding_Consumers\T1\textquoteright_Motivations) (accessed on 26 September 2021).
35. Wongkitrungrueng, A.; Assarut, N. The Role of Live Streaming in Building Consumer Trust and Engagement with Social Commerce Sellers. *J. Bus. Res.* **2020**, *117*, 543–556. Available online: <https://ideas.repec.org/a/eee/jbrese/v117y2020icp543-556.html> (accessed on 6 September 2021). [[CrossRef](#)]
  36. Lee, C.; Chen, C. Impulse Buying Behaviors in Live Streaming Commerce Based on the Stimulus-Organism-Response Framework. *Information* **2021**, *12*, 241. [[CrossRef](#)]
  37. Wang, H.; Ding, J.; Akram, U.; Yue, X.; Chen, Y. An Empirical Study on the Impact of E-Commerce Live Features on Consumers' Purchase Intention: From the Perspective of Flow Experience and Social Presence. *Information* **2021**, *12*, 324. [[CrossRef](#)]
  38. Ozuem, W.; Ranfagni, S.; Willis, M.; Rovai, S.; Howell, K. Exploring Customers' Responses to Online Service Failure and Recovery Strategies during COVID-19 Pandemic: An Actor–Network Theory Perspective. *Psychol. Mark.* **2021**, *38*, 1440–1459. Available online: <https://onlinelibrary.wiley.com/doi/full/10.1002/mar.21527> (accessed on 14 September 2021). [[CrossRef](#)]
  39. Guo, J.; Li, Y.; Xu, Y.; Zeng, K. How Live Streaming Features Impact Consumers' Purchase Intention in The Context Of Cross-Border E-Commerce? A Research Based on SOR Theory. *Front. Psych.* **2021**, *12*, 1–10. [[CrossRef](#)] [[PubMed](#)]
  40. Stahle, E. China's Live Streaming E-Commerce Reaches New Heights. *The China Guys*. 2020. Available online: <https://thechinaguys.com/chinas-live-streaming-e-commerce-reaches-new-heights/> (accessed on 13 September 2021).
  41. Kalakota, R.; Whinston, A. *Electronic Commerce: A Managers Guide*, 1st ed.; Addison-Wesley: Reading, MA, USA, 1997.
  42. Laudon, K.; Traver, C. *E-Commerce 2020–2021: Business, Technology and Society, Global Edition*, 16th ed.; Pearson Education Limited: London, UK, 2020; pp. 1–900.
  43. Vladimir, Z. Electronic Commerce: Structures and Issues. *Int. J. Electron. Commer.* **1996**, *1*, 3–23. Available online: <https://www.tandfonline.com/doi/abs/10.1080/10864415.1996.11518273> (accessed on 14 September 2021). [[CrossRef](#)]
  44. Sims, L. Introduction to E-commerce. In *Building Your Online Store with WordPress and WooCommerce*; Apress: Berkeley, CA, USA, 2018.
  45. Bragg, S. Electronic Commerce. In *The New CFO Financial Leadership Manual*; John Wiley & Sons, Inc.: Hoboken, NJ, USA, 2012; pp. 368–376.
  46. Jara, M.; Vyt, D.; Mevel, O.; Morvan, T.; Morvan, N. Measuring customer benefits of click and collect. *J. Serv. Mark.* **2018**, *32*, 430–442. [[CrossRef](#)]
  47. Mehta, S.; Saxena, T.; Purohit, N. The New Consumer Behaviour Paradigm Amid COVID-19: Permanent or Transient? *J. Health Manag.* **2020**, *22*, 291–301. Available online: <https://journals.sagepub.com/doi/full/10.1177/0972063420940834> (accessed on 15 September 2021). [[CrossRef](#)]
  48. McNealy, R. *Making Customer Satisfaction Happen*, 1st ed.; Kluwer Academic: Boston, MA, USA, 1998.
  49. Oliver, R. Customer Satisfaction Research. In *The Handbook of Marketing Research*; Sage Publications: Thousand Oaks, CA, USA, 1997; pp. 569–587. Available online: <https://methods.sagepub.com/book/the-handbook-of-marketing-research/n27.xml> (accessed on 15 September 2021).
  50. Chang, H.; Wang, Y.; Yang, W. The impact of e-service quality, customer satisfaction and loyalty on e-marketing: Moderating effect of perceived value. *Total Qual. Manag. Bus. Excell.* **2009**, *20*, 423–443. [[CrossRef](#)]
  51. Rita, P.; Oliveira, T.; Farisa, A. The impact of e-service quality and customer satisfaction on customer behavior in online shopping. *Heliyon* **2019**, *5*, e02690. [[CrossRef](#)] [[PubMed](#)]
  52. Kurata, H.; Nam, S. After-Sales Service Competition in Supply Chain: Optimization of Customer Satisfaction Level or Profit or Both? *Int. J. Prod. Econ.* **2010**, *127*, 136–146. [[CrossRef](#)]
  53. McLean, G.; Osei-Frimpong, K. Examining satisfaction with the experience during a live chat service encounter-implications for website providers. *Comput. Hum. Behav.* **2017**, *76*, 494–508. [[CrossRef](#)]
  54. Zhuang, M.; Cui, G.; Peng, L. Manufactured opinions: The effect of manipulating online product reviews. *J. Bus. Res.* **2018**, *87*, 24–35. [[CrossRef](#)]
  55. Karimov, F.; Brengman, M. Adoption of Social Media by Online Retailers. *Int. J. E-Entrep. Innov.* **2013**, *2*, 26–45. [[CrossRef](#)]
  56. Bleier, A.; Harmeling, C.; Palmatier, R. Creating Effective Online Customer Experiences. *J. Mark.* **2018**, *83*, 98–119. [[CrossRef](#)]
  57. Gu, S.; Ślusarczyk, B.; Hajizada, S.; Kovalyova, I.; Sakhbieva, A. Impact of the COVID-19 Pandemic on Online Consumer Purchasing Behavior. *J. Theor. Appl. Electron. Commer. Res.* **2021**, *16*, 125. [[CrossRef](#)]
  58. Rao, Y.; Saleem, A.; Saeed, W.; Haq, J.U. Online Consumer Satisfaction during COVID-19: Perspective of a Developing Country. *Front. Psychol.* **2021**, *12*, 1–12. [[CrossRef](#)] [[PubMed](#)]
  59. Gounaris, S.; Dimitriadis, S.; Stathakopoulos, V. An examination of the effects of service quality and satisfaction on customers' behavioral intentions in e-shopping. *J. Serv. Mark.* **2010**, *24*, 142–156. [[CrossRef](#)]
  60. Brady, M.; Robertson, C. Searching for a consensus on the antecedent role of service quality and satisfaction: An exploratory cross-national study. *J. Bus. Res.* **2001**, *51*, 53–60. [[CrossRef](#)]
  61. Su, Q.; Zhou, F.; Wu, Y. Using Virtual Gifts on Live Streaming Platforms as a Sustainable Strategy to Stimulate Consumers' Green Purchase Intention. *Sustainability* **2020**, *12*, 3783. [[CrossRef](#)]
  62. Nguyen, M.; Khoa, B. Customer Electronic Loyalty towards Online Business: The role of Online Trust, Perceived Mental Benefits and Hedonic Value. *J. Distrib. Sci.* **2019**, *17*, 81–93. [[CrossRef](#)]

63. Xu, Y.; Ye, Y. Who Watches Live Streaming in China? Examining Viewers' Behaviors, Personality Traits, and Motivations. *Front. Psychol.* **2020**, *11*. [[CrossRef](#)]
64. Cunningham, S.; Craig, D.; Lv, J. China's livestreaming industry: Platforms, politics, and precarity. *Int. J. Cult. Stud.* **2019**, *22*, 719–736. [[CrossRef](#)]
65. Hussain, A.; Mkpojiogu, E. A Systematic Review of Usability Test Metrics for Mobile Video Streaming Apps. *AIP Conf. Proc.* **2016**, *1761*, 020050. Available online: <https://aip.scitation.org/doi/abs/10.1063/1.4960890> (accessed on 16 October 2021).
66. Huang, Z.; Benyoucef, M. From e-commerce to social commerce: A close look at design features. *Electron. Commer. Res. Appl.* **2013**, *12*, 246–259. [[CrossRef](#)]
67. Yun, J.J.; Zhao, X.; Jung, K.; Yigitcanlar, T. The Culture for Open Innovation Dynamics. *Sustainability* **2020**, *12*, 5076. [[CrossRef](#)]
68. West, J.; Gallagher, S. Challenges of Open Innovation: The Paradox of Firm Investment in Open-Source Software. *R D Manag.* **2006**, *36*, 319–331. [[CrossRef](#)]
69. Weber, S.; Heidenreich, S. When and with whom to cooperate? Investigating effective of cooperation stage and type on innovation capabilities and success. *Long Range Plan.* **2018**, *51*, 334–350. [[CrossRef](#)]
70. Laursen, K.; Salter, A. Open for Innovation: The Role of Openness in Explaining Innovation Performance Among U.K. Manufacturing Firms. *Strateg. Manag. J.* **2005**, *27*, 131–150. [[CrossRef](#)]
71. Hutton, S.; Demir, R.; Eldridge, S. How Does Open Innovation Contribute to the Firm's Dynamic Capabilities? *Technovation* **2021**, *106*, 102288. [[CrossRef](#)]
72. Chesbrough, H.; Kim, S.; Agogino, A. Chez Panisse: Building An Open Innovation Ecosystem. *Calif. Manag. Rev.* **2014**, *56*, 144–171. [[CrossRef](#)]
73. Bogers, M.; Chesbrough, H.; Heaton, S.; Teece, D. Strategic Management of Open Innovation: A Dynamic Capabilities Perspective. *Calif. Manag. Rev.* **2019**, *62*, 77–94. [[CrossRef](#)]
74. Sorensen, J.B. The Strength of Corporate Culture and the Reliability of Firm Performance. *Adm. Sci. Q.* **2002**, *47*, 70–91. [[CrossRef](#)]
75. Albrecht, A. Ethics and technology design. *Ethics Inf. Technol.* **2006**, *9*, 63–72. [[CrossRef](#)]
76. Sommerville, I. *Software Engineering, Global Edition*, 10th ed.; Pearson Education Limited: Noida, India, 2016; pp. 119–140.
77. Mutascu, M. Artificial intelligence and unemployment: New insights. *Econ. Anal. Policy* **2021**, *69*, 653–667. [[CrossRef](#)]
78. Blumberg, B.; Cooper, D.; Schindler, P. *Business Research Methods*, 4th ed.; McGraw-Hill Education: London, UK, 2014.
79. Williams, C. *Research Methods. J. Bus. Econ. Res.* **2011**, *5*. [[CrossRef](#)]
80. Thomas, R. *Blending Qualitative & Quantitative Research Methods in Theses and Dissertations*; Corwin Press: Thousand Oaks, CA, USA, 2003.
81. Saunders, M.; Lewis, P.; Thornhill, A. *Research Methods for Business Students*, 7th ed.; Pearson Education Limited: Harlow, UK, 2019.
82. Bargas-Avila, J.; Hornbæk, K. Old wine in new bottles or novel challenges? A Critical Analysis of Empirical Studies of User Experience. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Vancouver, BC, Canada, 7–11 May 2011.
83. Bryman, A. *Social Research Methods*, 5th ed.; Oxford University Press: Oxford, UK, 2016.
84. Flick, U. *An Introduction to Qualitative Research*, 6th ed.; SAGE: Los Angeles, CA, USA, 2019.
85. Halskov, K.; Hansen, N. The diversity of participatory design research practice at PDC 2002–2012. *Int. J. Hum.-Comput. Stud.* **2015**, *74*, 81–92. [[CrossRef](#)]
86. Simonsen, J.; Robertson, T. *Routledge International Handbook of Participatory Design*, 1st ed.; Routledge: New York, NY, USA, 2013.
87. Duarte, A.; Brendel, N.; Degbelo, A.; Kray, C. Participatory Design and Participatory Research. *ACM Trans. Comput.-Hum. Interact.* **2018**, *25*, 1–39. [[CrossRef](#)]
88. Greenbaum, J. Towards Participatory Design: The Head and the Heart Revisited. *DAIMI Rep. Ser.* **1991**, *20*, 1–9. [[CrossRef](#)]
89. Harrington, C.; Erete, S.; Piper, A. Deconstructing Community-Based Collaborative Design. *Proc. ACM Hum.-Comput. Interact.* **2019**, *3*, 1–25. [[CrossRef](#)]
90. Kyng, M. Designing for a dollar a day. In Proceedings of the 1988 ACM Conference on Computer-Supported Cooperative Work, Portland, OR, USA, 26–28 September 1988; Volume 88.
91. Tomitsch, M.; Borthwick, M.; Ahmadpour, N.; Cooper, C.; Frawley, J.; Hepburn, L.A.; Kocaballi, A.B.; Loke, L.; Núñez-Pacheco, C.; Straker, K.; et al. *Design. Think. Make. Break. Repeat. A Handbook of Methods*, Revised ed.; BIS Publishers: Amsterdam, The Netherlands, 2018.
92. Anthopoulos, L.G.; Siozos, P.; Tsoukalas, I.A. Applying participatory design and collaboration in Digital Public Services for discovering and re-designing e-government services. *Gov. Inf. Q.* **2007**, *24*, 353–376. [[CrossRef](#)]
93. Davis, J. Early experiences with participation in persuasive technology design. In Proceedings of the 12th Participatory Design Conference on Research Papers, Roskilde, Denmark, 12–16 August 2012; Volume 1.
94. Ciolfi, L.; Avram, G.; Maye, L.; Dulake, N.; Marshall, M.; van Dijk, D.; McDermott, F. Articulating Co-Design in Museums. In Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing, San Francisco, CA, USA, 26 February–2 March 2016.
95. Zamenopoulos, T.; Alexiou, K. *Co-Design as Collaborative Research: Connected Communities Foundation Series*, 1st ed.; Bristol University/AHRC Connected Communities Programme: Bristol, UK, 2018.



96. Donetto, S.; Pierri, P.; Tsianakas, V.; Robert, G. Experience-based Co-design and Healthcare Improvement: Realizing Participatory Design in the Public Sector. *Des. J.* **2015**, *18*, 227–248. [CrossRef]
97. Cumbo, B.; Selwyn, N. Using participatory design approaches in educational research. *Int. J. Res. Method Educ.* **2021**, *45*, 60–72. [CrossRef]
98. Duffy, M. Methodological Triangulation: A Vehicle for Merging Quantitative and Qualitative Research Methods. *Image J. Nurs. Scholarsh.* **1987**, *19*, 130–133. [CrossRef]
99. Jervis, M.; Drake, M. The Use of Qualitative Research Methods in Quantitative Science: A Review. *J. Sens. Stud.* **2014**, *29*, 234–247. [CrossRef]
100. Johnson, R.; Onwuegbuzie, A.; Turner, L. Toward a Definition of Mixed Methods Research. *J. Mix. Methods Res.* **2007**, *1*, 112–133. [CrossRef]
101. Davis, D.F.; Golicic, S.L.; Boerstler, C.N. Boerstler. Benefits and challenges of conducting multiple methods research in marketing. *J. Acad. Mark. Sci.* **2010**, *39*, 467–479. [CrossRef]
102. Creswell, J.W.; Cheryl, N.P. *Qualitative Inquiry and Research Design: Choosing among Five Approaches*, 3rd ed.; SAGE Publications: Los Angeles, CA, USA, 2013.
103. Twining, P.; Heller, R.; Nussbaum, M.; Tsai, C. Some guidance on conducting and reporting qualitative studies. *Comput. Educ.* **2017**, *106*, A1–A9. [CrossRef]
104. Creswell, J. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*, 3rd ed.; Sage: Thousand Oaks, CA, USA, 2009.
105. Queirós, A.; Faria, D.; Almeida, F. Strengths and Limitations of Qualitative and Quantitative Research Methods. *Eur. J. Educ. Stud.* **2017**, *3*, 370–383.
106. Bell, J. *The Double Diamond: A Universally Accepted Depiction of the Design Process*; Design Council. Available online: <https://www.designcouncil.org.uk/news-opinion/double-diamond-universally-accepted-depiction-design-process> (accessed on 19 December 2021).
107. The Design Council. What is the framework for innovation? In *Design Council's Evolved Double Diamond*; Design Council: London, UK, 2019.
108. Braun, V.; Victoria, C. Using thematic analysis in psychology. *Qual. Res. Psychol.* **2006**, *3*, 77–101. [CrossRef]
109. Castleberry, A.; Amanda, N. Thematic analysis of qualitative research data: Is it as easy as it sounds? *Curr. Pharm. Teach. Learn.* **2018**, *10*, 807–815. [CrossRef]
110. Rigby, C. 'Serial Returners' Send Back Clothes Worth £7bn a Year to UK Online Retailers: Barclaycard. 2018. Available online: <https://internetretailing.net/operations-and-logistics/operations-and-logistics/serial-returners-send-back-clothes-worth-7bn-a-year-to-uk-online-retailers-barclaycard-17952> (accessed on 19 December 2021).
111. Sabando-Vera, D.; Yonfa-Medranda, M.; Montalván-Burbano, N.; Alborns-Garrigos, J.; Parrales-Guerrero, K. Worldwide Research on Open Innovation in SMEs. *J. Open Innov. Technol. Mark. Complex.* **2022**, *8*, 20. [CrossRef]
112. Wu, J.; Hisa, T. Developing E-Business Dynamic Capabilities: An Analysis of E-Commerce Innovation from I-, M-, To U-Commerce. *J. Organ. Comput. Electron. Commer.* **2008**, *18*, 95–111. [CrossRef]
113. Leih, S.; Linden, G.; Teece, D. Business Model Innovation and Organizational Design. *Bus. Model Innov.* **2015**, 24–42. [CrossRef]
114. Grabowska, S.; Saniuk, S. Assessment of the Competitiveness and Effectiveness of an Open Business Model in the Industry 4.0 Environment. *J. Open Innov. Technol. Mark. Complex.* **2022**, *8*, 57. [CrossRef]
115. Alberti-Alhtaybat, L.; Al-Htaybat, K.; Hutaibat, K. A Knowledge Management and Sharing Business Model for Dealing with Disruption: The Case of Aramex. *J. Bus. Res.* **2019**, *94*, 400–407. [CrossRef]
116. Suppatvech, C.; Godsell, J.; Day, S. The Roles of Internet of Things Technology in Enabling Servitized Business Models: A Systematic Literature Review. *Ind. Mark. Manag.* **2019**, *82*, 70–86. [CrossRef]
117. Ruggiero, S.; Kangas, H.; Annala, S.; Lazarevic, D. Business Model Innovation in Demand Response Firms: Beyond The Niche-Regime Dichotomy. *Environ. Innov. Soc. Transit.* **2021**, *39*, 1–17. [CrossRef]
118. Gil-Gomez, H.; Guerola-Navarro, V.; Oltra-Badenes, R.; Lozano-Quilis, J. Customer Relationship Management: Digital Transformation and Sustainable Business Model Innovation. *Econ. Res.-Ekonom. Istraz.* **2020**, *33*, 2733–2750. [CrossRef]
119. Yuana, R.; Prasetyo, E.A.; Syarif, R.; Arkeman, Y.; Suroso, A.I. System Dynamic and Simulation of Business Model Innovation in Digital Companies: An Open Innovation Approach. *J. Open Innov. Technol. Mark. Complex.* **2021**, *7*, 219. [CrossRef]
120. BBC News. Available online: <https://www.bbc.co.uk/news/world-asia-china-59732499> (accessed on 10 December 2021).
121. Grayson, N. Twitch Hate Raids Are More Than Just a Twitch Problem, and They're Only Getting Worse. *The Washington Post*, 2021.
122. Merritt, K.; Zhao, S. Software Design and Development of an Appointment Booking System: A Design Study. In *Smart IoT and Big Data for Intelligent Health Management*, 1st ed.; Ur Rehman, M., Zoha, A., Eds.; Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering; Springer: Cham, Germany, 2021; Volume 420, pp. 275–294. [CrossRef]