



# ICL

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# ICL Journal

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## Chairman's message

I am delighted to report that we have for the first time published a second ICL Journal in one calendar year. This was always our ambition but has been thwarted by all the usual delays and issues that challenge research publication and deadlines worldwide. It is encouraging to see that the five papers in Volume 5, Issue 2 of the ICL Journal offer a fine range of topic and substance and are again grounded in real and current issues which have everyday relevance to us. Our researchers, six of our staff and five of our Master's students, have delivered practical insight to the diversity of ICL's research activity.

For some time, the world will be reflecting on Covid-19, and the paper on chatbots offers suggestions as to why social media became more of a force during the days of the pandemic. Communication for all of us suddenly became more difficult, and even reluctant users of technology were wrestled into trusting unfamiliar technology.

There is little closer to the heart of Joe Public than a visit to the supermarket, and I suspect we have all been challenged by self-checkout machines. Bringing our own bag is fraught but bring it we must. It is encouraging that the paper shows a 90.7% satisfaction rate: testament to the wide-reaching power of machine learning. But I wonder what it would have been pre-pandemic.

Surely the place of the supermarket in the heart of Joe Public must be closely rivalled by our nurturing of cats! We have a penetrative paper with a fascinating historical and contextual introduction including the remarkable statistic that almost half of NZ households have a cat. It is fascinating to see the extension of Maslow's hierarchy of needs to cats, and possibly the only weakness in the paper is that the cats themselves weren't surveyed.

Back to Covid and one of the most significant impacts on educational institutions: the attending of events online. We have all been affected by Zooming, for good or ill, but possibly not gone beyond a crude assessment of the bald advantages and disadvantages. This paper provides a comprehensive analysis, and with authority reaches the conclusion that online events are excellent, but ... .

Finally, we see how digital platforms impact on the youngest in our community, with an analysis of literacy experiences in the ECE setting. Happily, the conclusion is that digital technologies have a positive impact in supporting literacy, and there is hope that we will soon learn not only from our teenage children how better to master technology, but from our babies as well!

Ewen Mackenzie-Bowie  
Chairman  
ICL Education Group





# Using Chatbots during COVID-19: How satisfied are customers?

**Dr Michèle Akoorie, Dr Zarqa Shaheen Ali and Thuy-Thung Chung**

ICL Graduate Business School

## **ABSTRACT**

This paper acknowledges the benefits Chatbot can bring to customers. Based on these benefits, the influence of Chatbot will be shown on customers' satisfaction, especially in the COVID-19 pandemic, during which face-to-face interaction is seriously restricted. Most services are transferred to online interaction and support instead, therefore, customers, sometimes reluctantly, have to get to know more about how to use online services and how to ask for support through new technologies.

The study of the impact of customers' satisfaction with their experiences when using Chatbot can be an open view for both customers and organizations that have launched this technology. Especially during the COVID-19 pandemic, which causes numerous significant restrictions and necessitates customers to use online services most of the time, it is necessary for customers to receive a similar quality of services as they have experienced previously. Therefore, understanding and gathering customers' feedback regarding their satisfaction will play a vital role in terms of improving the capacities as well as the function of Chatbot. Services related to Chatbot will also increase consumers' trust and lead to positive achievements in the future.

**Keywords:** Chatbot, Customer satisfaction, Business, COVID-19

## **1. INTRODUCTION**

Chatbot has brought sizable benefits for enterprises and end-users because its functions cover the needs of customers. They include the accurate and up-to-date information Chatbot provides to people, its fast response speed compared with traditional interaction with humans, and the ready availability of the Chatbot service. In addition, the guaranteed security of Chatbot operations is a most significant development for customers. Chatbot also brings new

experiences for customers, especially in the e-commerce field. With the new support of AI technology, it has solved a huge issue for businesses regarding having the manpower to respond to queries about online trading. Customers always expect to receive a fast response to their concerns about the services or products so that they can decide whether to purchase or not. The quicker the response they give, the more income businesses can earn. E-commerce has recently become extremely popular because of its convenience. It also requires the state-of-the-art technology to handle a large volume of trading, which manpower either cannot handle or does not enough capacity to cover adequately (Sfenrianto & Vivensius, 2020).

In the healthcare system, Chatbot provides significant benefits, especially during the COVID-19 pandemic (Miner & Laranjo, 2020). Due to the rapid spread of the virus and the seriousness of the pandemic, many people were afraid of asking questions and presenting their symptoms to doctors for their advice. Stigmatized conditions are factors that lead to people preferring to contact Chatbot rather than a human supporter because this might influence their family or their jobs. Confirming this, during COVID-19, accessibility via Chatbot has increased up to billions of users. Another benefit of Chatbot in this field is the repetition of the information related to hand washing and social distancing in the pandemic, which fills the gap between knowledge and action, as well as suggesting tips for behaviour change. With these operations, Chatbot contributes to the transmission-reducing behaviours, which are very relevant for those who work in the healthcare field and for the community in general. More importantly, Chatbot is considered an effective tool for lessening the harm of pandemic-related isolation, trauma, and depression. As the pandemic spread so fast, this meant a lack of preparation for clinicians to be trained and cope with new situations. However, with its advantages, Chatbot can play a role in reducing the psychological harm of isolation.

In the e-learning field, Chatbot supports several areas such as recruiting new students, student support regarding services in the universities and colleges, registration of new courses, and campus self-service (Issa, 2019). With the state-of-the-art functions of Chatbot, the number of registrations of new students increased since potential students could easily receive the necessary information for their queries regarding campus, scholarships, staffing, etc. It also assisted admissions regarding recruitment procedures and documentation. The support of Chatbot was open 24/7, which brought huge convenience for students to manage their time for questions. Also, there are no limits to access since Chatbot is available for both desktop and mobile applications. Existing and new students could find direct answers to their questions without waiting or searching for the right direction.

For government agencies, political parties and politicians, Chatbot is used for many purposes including social media discussions, topic trend creation, message retransmission (Androutopoulou et al., 2018). Chatbot also assists government functions in handling citizens' services 24/7, such as answering questions, complaints, and inquiries through customer support systems, searching documents, guiding citizens to fill in forms, and translating governmental information.

By understanding the expectations of customers, Chatbot developed and improved its functions and capacities to cope with many users. Several evolutions of Chatbot are listed consisting of natural language in conversation, quick responses, speed of response, and session duration. As a result, Chatbot is implemented in alternative services such as online banking, financial services, insurance, food, and restaurants, as well as e-commerce. For those services, Chatbot plays the role of an assistant to support customers with their queries. On the other hand, Chatbot also presents as an advisor in some services, that help customers to gain more information and make up their minds quickly based on their needs and expectations.

## **1.1 Background**

Chatbot is a program that is able to communicate with a person or another chatbot and make them believe that they are speaking to a real person (Zemčík, 2019). This impression is pointed out as reflecting the rules of social norms, relationships, and obligations. Chatbot is a computer program which performs prompt conversations with end-users, especially via the internet (Adamopoulou & Moussiades, 2020). This program is designed to implement natural language processing (NLP) as well as sentiment analysis to perform the same as human language, by text or oral talk to end-users or other chatbots. Chatbot is also known by different terms including machine conversation system, virtual agent, dialogue system, and chatterbot. Chatbot is constructed to simulate human conversation to speak using informal language like humans and to use this ability to perform chat communication.

According to Adamopoulou and Moussiades (2020), Alan Turing, known for the Turing Test ("Can machines think?"), introduced the idea of automated conversations with a computer program in 1950. The very first actual chatbot was named ELIZA and was developed in 1966, functioning as a psychotherapist that answered questions. Initially, interactions with ELIZA were confusing for users since people were not used to communicating with computers at the time. After that, the original version of Chatbot underwent many improvements and became the basis for new applications such as PARRY in 1972 or A.L.I.C.E. in 2000. Subsequently, even more advanced versions of Chatbot were used through alternative messenger applications.

Virtual assistance technologies such as Google Assistant, Apple Siri, and Amazon Alexa, all work because of Chatbot software (ZEMČÍK, 2019). Since 2016, Chatbot has become more widely known and relevant for industrial solutions. Pattern Matching shows the stimulus-response blocks which present the stimuli and response to a sentence. This recognition brought some disadvantages to light as it showed a predictable repetition and a lack of human elements. Artificial Intelligence Markup Language and Latent Semantic Analysis were an updated version of Pattern Matching but still did not achieve a significant improvement. Chat Script was considered the successor of a previous version, which combined various topics and checked for suitable matching. It also included a long-term memory with the capacity to store information such as the name or age of users. Another level of Chatbot technology was Natural Language Processing which analyzed the manipulation of natural language text to utilize natural expressions. Finally, entity and contexts were the most modern technological advances that revealed the development of Chatbot by extracting values from natural language inputs and presenting the answers based on the system entity or domain entity. Additionally, Chatbot is classified into alternative types based on the knowledge domain, the service provided, the goals, the input processing and response generation method, the human-aid, and the build method.

Another applicable use of Chatbot mentioned was named A.L.I.C.E, which was considered to be an artificial intelligence natural language, especially for children to learn a new language. The advantages of this application were its ability to be edited for educational purposes, and to encourage children to talk to the system and learn new things (Grötsch et al., 2015). One of the significant innovations of AI chatbots, especially in New Zealand, was an artificial intelligence named SAM – Semantic Analysis Machine – which was published in 2017. The role of SAM was to be a representative of New Zealanders who could understand in depth about politics and represent views to people (Langelaar, 2017). This project was a collaboration between Victoria University of Wellington, the technology company Touchtech, and technology entrepreneur Nick Gerritsen. With the considerable functions of infinite memories, SAM was able to remember all the information people told her. Thus, SAM would consider everybody's views without any bias or misrepresentation of information. Based on these functions, SAM played a vital role in reducing a huge gap between the desires of voters and promises of politicians and what they could receive. Even though SAM was developed to become a representative of New Zealanders, she had to be input with and had to digest significant information to complete the role as expected. However, this was a remarkable achievement for New Zealanders at the time for the development of artificial intelligence technology.

## **1.2 Types of Chatbot**

Chatbot is divided into alternative types based on the ease of user interface and the required technologies: menu or button-based Chatbot, keyword recognition-based Chatbot, and contextual Chatbot.

### **Menu/button based Chatbot**

Menu/button-based Chatbot is known as the most common and simplest type of Chatbot since it is usually formed using buttons and top-down menus. The structure of this type uses the principles of decision trees, whereby you can decide to receive the support. The end-users are guided to select options and appropriate answers from artificial intelligence (AI). However, this menu-based Chatbot is reviewed as having a slow performance and did not meet customers' expectations (Aishwarya, 2020).

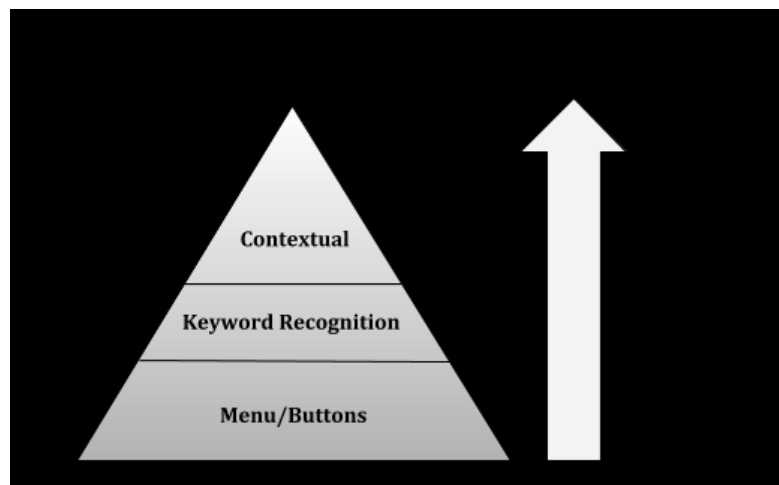
### **Keyword Recognition-based Chatbot**

For this type, Chatbot recognizes particular key words so as to release proper responses to end-users. Chatbot answers queries based on what end-users enter or list in the conversation, by using algorithms. For instance, the end-user asks a question: "How do I set up an auto-login authentication on my phone?", so Chatbot selects keywords such as 'auto', and 'login' in order to choose an appropriate answer. This type might not achieve an adequate solution for end-users if there are some redundant keywords (Aishwarya, 2020).

### **Contextual Chatbot**

The contextual type is marked as the most significant and advanced Chatbot in the market, for several reasons. Chatbot uses applied artificial intelligence and machine learning technologies such as voice recognition and speech-to-text conversation, to understand end-users' thoughts and concerns. From this information and hints, Chatbot finds out what the users' intentions are and provides thoughtful answers by deciphering the patterns in the database. Every time Chatbot interacts with an end-user, it learns and builds up more experiences (Aishwarya, 2020).

Below are the preferences of Chatbot:



*Figure 1.1 Preferences of Chatbot*

### 1.3 Applications of Chatbot

#### **Humourist Chatbot system**

The main purpose of this application is to make users laugh. Chatbot is programmed to tell humorous anecdotes based on the knowledge that Chatbot digests. It also has the capacity to listen to jokes in its conversation with users, identify jokes by keywords and then reply accordingly with funny images and textual responses (Aishwarya, 2020).

#### **Dorothy network management Chatbot**

Every industry and software application needs network management, especially security measures and protocols. Dorothy network management Chatbot is the one that will protect the network from management protocols. All the information and data has to be generated and processed by the central module before it is returned to users. It is more secure and prevents missing data at some stages (Aishwarya, 2020).

#### **Adaptive modular architecture based Chatbot**

This type of chatbot is based on modular knowledge representation and proof-of-concept. This modular architecture supports Chatbot in having a more flexible style of response. The knowledge representation model is combined from several factors such as dialogue engine, dialogue analyzer and *corpus callosum* (Aishwarya, 2020).

## **Web-based voice Chatbot**

As the name suggests, web-based voice chatbot system uses voice recognition technology to communicate with users. Chatbot will learn over time from conversations to accept commands in written or oral form and will understand natural language. In this respect, the communication structure is managed by a web service and includes three dimensions: client, server and content acquisition (Aishwarya, 2020).

### **1.4 Roles of Chatbot**

Besides the innovative technology of Chatbot, it was known for two popular roles. It was made to become a personal assistant for the user (Nair & Johnson, 2018) as it had the ability to imitate human conversation and answer users' questions. Another implementation of Chatbot applications was the function of supporting users by being able to send emails automatically because their personal details were already recorded when logging into the applications.

#### **1.4.1 Assistant**

Especially in the education field, Chatbot played a useful role as an assistant since it brought various benefits for new learners, such as the ability to tell a story, and guidance for a quiz. Additionally, Chatbot could act as a human to read instructions, and pronounce words and phrases accurately for learners to copy them (Dokukina, 2019). An additional illustration of Chatbot as an assistant was its support of users in sending out appointment requests for meetings with clients, and receiving meeting messages (Mhatre et al., 2016). Users only had to fill in a form consisting of details of clients such as name, email, date, time of meeting, and reason for the appointment. Chatbot would gather all the information, convert it into a template and send out the invitation according to the time, which was set in advance. Similarly, Chatbot was able to extract the meetings based on keywords that matched with the message. Several alternative assistants of Chatbot were to read new emails, check calendars to find out schedules, and update calendars according to upcoming meeting arrangements.

#### **1.4.2 Advisor**

On the other hand, Chatbot also plays the role of advisor. In particular, in financial services, Chatbot has been used, in a recent trend, to improve customer engagement. It became more popular in this field since it could cover 24/7 services in the business operation, and it extended working hours to serve more customers outside of office hours. The main advantage of Chatbot in financial services is to provide a prompt response to potential customers, add new experiences to customers and engage them to use the services in the future. Chatbot always offers them a position of superiority compared with the

traditional human advisor, which makes customers feel free when interacting with Chatbot. As details of financial products are provided properly and promptly, customers receive a proper engagement to decide and buy new services besides the usual supports such as transfers, deposits, upcoming payments, credit card history, credit limits, and so on. Therefore, sales increased constantly and rapidly. Regarding business operations, the Chatbot advisor role was considered a cost-effective alternative to manpower and generally at a low cost (Patil, 2019).

## **2. DIGITAL COMMUNICATION OF CHATBOT**

Chatbot was originally constructed on the website with fundamental functions for basic conversation. However, it has developed new alternatives and advanced principles in order to meet the expectations of customers (Khan & Das, 2018). One of them was the development of Chatbot on mobile, which increased the opportunity for customers to pose their questions at their convenience. With this design, its function is available for messages such as carousels, buttons, images, and videos, as well as plain-text messages. The customers found similar advantages to the functions on mobiles compared with on the website. Based on the message sent to Chatbot, the source would be identified in terms of name, region, time zone, locale, and so on. When locale was available, the language would be switched accordingly so as to match with the language of users. Quick replies were also a new improvement of Chatbot functions, which presented the understanding of Chatbot towards the queries of customers as well as repeating the typing of the same message. The customers could either choose available suggested answers or release proper replies. Also, Chatbot improved the use of multimedia messages including images, videos, and files. As for images, messages were conveyed through animations. It was not only a new way to make users more excited, but it was also a way for Chatbot to demonstrate feelings to the users. Graphics Interchange Format (GIFs) pictures were considered as an innovation of messages. Most of the Chatbot platforms allowed users to send a video, which was easier for sharing the information.





At the same time, files in general could be sent through Chatbot's platforms. This was a significant development, especially in the business field. Users were able to send files quickly with this new platform instead of using traditional ones like email or documents. One of the significant developments of Chatbot was the speed of its responses. Normally, it would take a couple of seconds, or longer, for a real person to respond to a message if that person did not speak to anyone else. This meant users could have to wait up to a few minutes to receive replies. However, Chatbot was developed to be able to answer the queries in about a second, ideally. If there were any errors related to Chatbot, it would inform the users so that they would understand the situation. This function was helpful and supportive for customers because they were kept in the loop with the immediate information; therefore, they could proactively decide whether they should choose another time for their questions or wait until Chatbot was available again.

Communication was not only important for end-users, but it was also considered as a significant channel of connection among businesses. Chatbot has been improved to cope with the mixed and expanded needs of enterprises. There were five models of communication that Chatbot was involved in as an assistant: Business-to-Business (B2B), Business-to-Consumer (B2C), Consumer-to-Consumer (C2C), Business-to-Employee (B2E), and Employee-to-Employee (E2E). Regarding B2B, every business needs a person or a group of people playing a role or being a representative to interact with other businesses in terms of products or services. Therefore, Chatbot was deployed to handle communications and assistance on aspects such as opening and closing times, location of various offices, product information, contact information, and so on. In B2C, consumers could use different services depending on the type and geography of the business. Based on this need, Chatbot was constructed to play a role as an e-commerce Chatbot to provide all the product and service information about a business as well as to answer queries about pricing, registering tickets for products and their related issues, and so on. Another communication was between consumer and consumer. In this category, Chatbot simply played the role of supporter for the quality of conversations, especially in a social shopping category. As for Business-to-Employee (B2E), it became more popular for this kind of interaction. One of common popular applications was related to HR queries, whereby Chatbot could reduce the burdens on actual employees in answering back and forth on HR policies, vacation time, and similar queries. Chatbot was considered a representative of the organization to communicate with employees. It was useful for large-sized enterprises where a huge number of questions from employees are asked every day. HR staff could save their time for other priorities without any concerns. The last model of communication was employee-to-employee, which increased the productivity of employees in an

organization. Thus, new applications were deployed to support communication among employees, such as Slack, Skype for Business, or Microsoft Teams.

The development of Chatbot was covered by vertical industries such as internet banking, travel bots, insurance, food, and restaurants. Firstly, the normal process of online banking was activated through a chat interface consisting of finding a branch nearby, checking a balance, requesting a money transfer to another account, and so on. With Chatbot, customers can ask for support when requesting a new card or blocking a stolen card. Chatbot had permissions to conduct the requests on behalf of users. Similarly, in the insurance industry, Chatbot was accepted by some users who could use Chatbot to register insurance claims, find out the status of claims, as well as collect information about other insurance products. Additionally, based on statistics of selling via Chatbot, the enterprises were able to prepare new products for users. On the customers' side, they were consulted by Chatbot regarding information Chatbot provided, therefore, this helped them to make decisions quickly. As a result, it brought significant benefits for companies by increasing the number of sales.

In the travel industry, especially regarding booking bots, Chatbot improved support to customers by maintaining previous information about prices, flights, hotels, etc., so that they could check easily when there was any change. Loading history and being visible to new chats were new improvements of Chatbot that presented advanced benefits for customers. Moreover, Chatbot had a function of searching for and recommending places and activities customers could do in that place. That information was extremely useful for customers making necessary preparations for upcoming trips. There were several advancements of Chatbot in the food and restaurant industries. Instead of using phones for table reservations, Chatbot was implemented for customers to book a table for multiple options of people, without any waiting time. It was also convenient when users could do this at their convenience. Another advance of Chatbot in this industry was to construct a bartender bot, in which users were able to ask for suggestions about alternative drinks or cocktails based on ingredients that had been entered into Chatbot. This innovative function of Chatbot proved a huge change and a challenge for the new technology, in which resource data played an extremely important role for the outcome of Chatbot and in meeting the expectations of customers.

## **2.1 Expectations of customers towards Chatbot's functions**

Customers not only wished to receive simple responses, but they also wanted to have longer and more knowledgeable replies from Chatbot to experience it as though they communicated with a human. They liked to visualize they were

talking to a real person with feelings, and to receive additional information rather than basic responses. Secondly, wordings might cause problems with Chatbot not understanding the questions of customers. Thus, letting Chatbot learn similar words, as well as digesting more and more new words, would make the conversation lively. The customers would not feel they were speaking to Chatbot; moreover, they could enjoy talking without any interruptions (Kurachi & Narukawa, 2018).

With reference to the dimensions that lead to customers' satisfaction, it was noticed that loyalty, engagement of customers, intention to use services, and word-of-mouth communication of customers were the usual methods to measure how satisfied customers were when experiencing Chatbot. Since Chatbot has been developed and deployed in various businesses and services, it has been proven that Chatbot's advantages have brought significant positive outcomes in alternative fields including education, healthcare systems, e-commerce, and e-learning. In general, Chatbot plays a vital role in connecting enterprises and customers quickly, providing useful information in a proper and prompt way, as well as being available to meet customers' different needs. As for particular fields such as e-learning and healthcare systems, in which repeated queries occur, Chatbot acted as an experienced employee to handle multiple questions without delays. This helped businesses by saving on manpower costs while still providing an effective service. Additionally, when customers received suitable responses to their queries, it was easier for them to make a decision; therefore, sales were increased rapidly compared with the traditional way.

## **2.2. Ways to measure customer satisfaction**

There are several parameters that have previously been found including loyalty, word-of-mouth communication and the intention to use the services to measure customers' satisfaction.

### **2.2.1. Word-of-mouth**

The most traditional way to determine whether a customer's expectations have been met is through word-of-mouth (Feine & Morana, 2019). The customer's recommendation to someone else directly translates into a well-provided service, whereas the customer's disapproval would mean the opposite. In the same way, word-of-mouth is used to establish if Chatbot can satisfy customers and please their needs according to their expectations. Even though this way cannot really be documented and produce visible data, it is still useful and significant in business or in any other field to conclude the success of a product or service. In this situation, the more people know about it, the higher the satisfaction of customers. Moreover, customer satisfaction is measured based on the intention of customers to use the service. In other words, the number of

interactions between customers and Chatbot shows how pleased the customers are with its provided services. Since numerous enterprises have been applying AI technology to their businesses, providing support to deal with customers' issues and questions, it is highly likely that a customer will communicate with a Chatbot application first instead of interacting with a human being. Chatbot is set as the first point of contact to answer frequently asked questions and solve common problems with easy solutions. The more complicated matters still need to be processed by a human customer service representative. Therefore, the fewer communications the employee must handle, the higher the quality of their problem solving will be, which in turn will elevate the satisfaction levels of the customers with the Chatbot services and support in general.

### **2.2.2. Loyalty**

Satisfaction can be shown as a positive and significant service experience leading to customer loyalty (Prentice, 2020). To ensure a beneficial experience for customers, engagement is listed as the main factor influencing them to use the new technology. Four aspects lead to a high level of customer engagement: reliability, assurance, empathy, and responsiveness. When using a service, customers will expect to receive accurate and complete information, comprehensiveness, and flexibility in the response, as well as a timely response to the request. For example, to be able to provide concrete information for reassurance, an online survey was conducted and collected for those who use AI services in Australian hotels, with over five hundred responses within two weeks. The results showed a consistent level of expectation from the AI application when customers and employees used the service. When the guests can make use of the hotel's services effortlessly and experience the implementation of new technology without problems, it is more likely that they will return and provide positive reviews. Moreover, the integration of emotional intelligence is used to further increase the service experience. Especially, a high emotional intelligence with a high control of their emotions usually presents a positive review of AI services and a better understanding of their limitations. Therefore, once the engagement is built up, it will lead to loyalty from customers, which reflects customer satisfaction. On the other hand, based on the result of the questionnaires, it was found that responsiveness and assurance are positive outcomes of engagement, which facilitate customer loyalty, therefore, their satisfaction is demonstrated.

### **2.2.3. The importance of customer satisfaction**

The importance of Chatbot and satisfaction of customers is because it influences buying decisions and potential-to-be-repeat customers in E-commerce (Sfenrianto, 2020). There are four dimensions that affect customers' decisions: accuracy, content, format, and affordances. These are

vital because they provide necessary and useful information for customers to understand more about the product or service before they make further decisions. Chatbot can cover necessary factors, which lead to the improvement of selling on E-commerce. Also, Chatbot technology could support users to make transactions as well as for comparison of prices for items, which is more convenient and accurate when looking for things. Customers were also satisfied with the speed of responses through Chatbot. The availability of Chatbot was also one of the vital parts of users' experiences that made customers happier when they could place the questions in unlimited time. Based on those factors, customers seemed to be loyal to e-commerce services; therefore, it was understandable that sales would be increased significantly.

### **2.3. Limitations of Chatbot**

Even though Chatbot has recently become a supporting tool for people, and received sizable recognition from end-users, its functions and capacities are still limited at some stages. Several restraints were listed, such as lack of human context, high installation cost, repetition, little basic assistance, lack of empathy, and so on (Dqindia, 2020). Chatbot was considered a state-of-the-art technology to cover for a human's workload; however, Chatbot could not handle complex queries or conversations. This led to the issue that answers were repeated several times because Chatbot might not understand complicated questions from users. Therefore, end-users would not be satisfied with the answers of Chatbot compared with interacting with a human. Another factor related to communication was the lack of empathy of Chatbot, since it was not human, so could not present feelings such as being happy, angry, or sympathetic to customers. Chatbot could hold a conversation, but it could not bring actual connection with customers. Also, from a business perspective, deploying Chatbot costs a large amount of money since Chatbot needed to be set up and programmed carefully. It also required another budget for maintenance and constant upgrades.

## **3. MATERIALS AND METHODS**

Since Chatbot has been applied in several enterprises, people have recognized the advantages of Chatbot as a convenient and speedy application for their queries and requirements. A questionnaire was designed to find out the opinion of New Zealanders about the use of Chatbot. The questionnaire includes age, gender, period of time using Chatbot, dimensions of customers' satisfaction with Chatbot, frequency of interaction with Chatbot during the COVID-19 pandemic, and their expectations of Chatbot's functions in the future. As the questionnaire had multiple-choice questions and answers, it took three to five minutes to complete. The questionnaires were distributed to 150 respondents non-randomly who were living in Auckland, New Zealand. The questionnaires were sent by email to IT students living in Auckland city, and from those

people, the questionnaires were sent to other people in the IT community and to close networks and contacts of these IT students. The data was analysed, and the findings are presented in the next section.

## **4. FINDINGS**

### **4.1. Gender and Age**

Among 149 responses, there were 57 females (38.3%) while males accounted for 89 people (59.7%) and three people did not mention their gender. Most respondents who participated in the research were male, as most who received the questionnaires were working in the IT industry or had fundamental knowledge of IT, which still tends to be male dominated. Regarding age, the outcome showed that young people in their 20s to 30s were the largest group that participated in the survey. The second largest group that joined the survey was in their 30s to 40s, being 32.9%. The older ages, from 41 to 50, represented only 13.4%, which was less than 50% of the second group. The last two groups that had small percentages were the people who were over 50 years old and those who were less than 20 years old. The younger participants were the ones who had more interest in Chatbot and were more involved in the questionnaires than the other age groups. The middle-aged people were also willing to take part in the survey, and the rest of the participants also had used Chatbot or had an idea about it so that they could be confident in answering the questions, but these latter groups were less conversant with it than the younger group. This showed that Chatbot has been in the public domain for enough time; however, there was only a specific age of people that had the interactions and experiences with using Chatbot for their queries and needs. The rest might prefer the ordinary method whereby they receive the support from in-store employees, or they might not have had opportunities to explore new technology like Chatbot.

## 4.2. Length of time of using Chatbot

Table 4.2.1 presents the length of time that participants had used Chatbot for any online services.

The length of use	Number of people	Percentage
More than a year	18	12.10%
06 months to a year	62	41.60%
03-06 months	35	23.50%
01-03 months	13	8.70%
Less than a month	21	14.10%

***Table 4.2.1 Number of people and their length of time using Chatbot***

Even though most enterprises had launched online services, most participants showed that they had only used Chatbot for half a year at most. That meant only 62 out of 149 people had long-term experience of Chatbot. The second largest percentage belonged to people who had used Chatbot for only three to six months, being 35 people or 23.5%. Not many people have used Chatbot for more than one year. The data from the table above indicated only 18 people had been using Chatbot for a long time. By contrast, the numbers of people who started experiencing Chatbot in a short period of time were significant, including 13 people who had only used Chatbot during the last three months and 21 participants who had explored Chatbot within less than a month.

From the data about the length of participants' use of Chatbot, it was evident that it became more popular lately during the COVID-19 pandemic. Even though it was known by numerous people, the percentages of those who had used Chatbot from a few weeks to four months approximated the percentage of those who had used Chatbot for over a year. This presented significant new opportunities for end-users to experience new technology when they were in this specific situation. Merging the percentage of participants who had used Chatbot for about a month and those who had used Chatbot within three months indicated that this nearly reached half of the percentage of people who had been using Chatbot for half of a year constantly.

## 4.3. Functions of Chatbot and customer satisfaction

There were five dimensions related to customer satisfaction: clear format, easy

to access, easy to understand, waiting time for response, and first time of experience.

	Clear format		Easy to access		Easy to understand		Waiting time for response		First time of experience	
Very satisfied	99	66.4 %	54	36.2 %	70	47.0 %	75	50.3 %	80	53.7 %
Satisfied	31	20.8 %	81	54.4 %	58	38.9 %	45	30.2 %	42	28.2 %
Neutral	15	10.1 %	11	7.4 %	17	11.4 %	24	16.1 %	18	12.1%
Unsatisfied	1	0.7 %	1	0.7 %	2	1.3 %	4	2.7 %	5	3.4 %
Very unsatisfied	3	2.0 %	2	1.3 %	2	1.3 %	1	0.7 %	4	2.7 %

**Table 4.3. 1 Dimensions of customers’ satisfaction of using Chatbot**

As for the clear format, approximately 87% of responses indicated that they were happy with it. Only about 3% of people were not satisfied with the format while another 10% gave a neutral comment. With access to Chatbot, the results showed a similar number, with 90% of participants in agreement about their satisfaction. A small number of people felt unsatisfied and 7.4% left unclear comments about Chatbot. For the aspect of being easy to understand, the percentage of satisfied people was lower than the other two mentioned dimensions, at about 85%. The neutral idea accounted for 11.4% and the unsatisfied percentage increased slightly to 2.6%. The last two criteria of waiting time for response and the first time of experience received less satisfaction from participants than previous factors. Sixteen percent of respondents showed that they were unhappy with the waiting time for response, while only 12% was shown for the first time of experience. By contrast, participants seemed not satisfied with the first time of experience when they marked the percentage up to 6.1%.

Chatbot’s functions—consisting of clear format, ease of access and ease of understanding—had convinced end-users, with a high percentage of satisfaction. This also meant that Chatbot had developed and significantly improved its characteristics so that Chatbot could cope with a large number of users at the same time at first, as well as meeting the high expectations of end-users in the same way as when they communicated with a human. Regarding the other two dimensions receiving lower percentages, ‘waiting time for response’ and ‘first time of experience’, there is a possibility that participants



did not know for sure about how Chatbot responded. In other words, they might not be clear if it was Chatbot which answered their queries or not. That was why only about 80% of participants felt satisfied with their interactions with Chatbot. However, since this was their very first experience with Chatbot, it was still presented as a positive outcome by end-users about the new technology.

#### 4.4. Alternative functions of Chatbot and customer satisfaction

Five additional aspects of Chatbot were listed in the questionnaires for participants to demonstrate their views about the development of Chatbot. In this question, five other dimensions were mentioned: appropriateness of response, ability to process common speech, awareness of context during conversation, being empathetic during interactions, and fast processing of questions.

	Appropriateness of response		Be able to process common speech		Be aware of context during conversation		Empathetic during interaction		Fast processing of my questions	
Very satisfied	63	42.3 %	33	22.1 %	36	24.2 %	46	30.9 %	53	35.6 %
Satisfied	62	41.6 %	85	57.0 %	74	49.7 %	60	40.3 %	70	47.0 %
Neutral	13	8.7 %	24	16.1 %	27	18.1 %	32	21.5 %	15	10.1 %
Unsatisfied	10	6.7 %	6	4.0 %	10	6.7 %	8	5.4 %	9	6.0 %
Very unsatisfied	1	0.7 %	1	0.7 %	2	1.3 %	3	2.0 %	2	1.3 %

**Table 4.4. 1 Additional dimensions of customers' satisfaction of using Chatbot**

As shown in Table 4.4.1, percentages of the two criteria accounting for the highest number of satisfied users were 'appropriateness of response' and 'fast processing of questions', at 83.9% and 82.6%, respectively. Following that, the ability to process common speech was marked as the next highest percentage at 79.1%. The other aspects including awareness of context during

conversation and being empathetic during interactions had, respectively, a 73.8% and 71.2% satisfaction rating from participants. In addition, participants had the highest percentage of neutral views for the aspect of being empathetic during interactions, at 21.5%. The following percentages that accounted for higher numbers belonged to the criteria of the ability to process common speech and awareness of context during conversation, at 16.1% and 18.1%, respectively. The last two aspects received the lowest marks, being 8.7% for appropriateness of response and 10.1% for fast processing of questions. Regarding 'unsatisfied' points, the aspect of being empathetic during interactions received the highest percentage. Three criteria had similar 'unsatisfied' percentages, being appropriateness of response, awareness of context during conversation, and fast processing of questions, at 7.4%, 7.4% and 7.3%, respectively. The other aspect that received a low percentage was the ability to process common speech, at 4.7%.

Among additional dimensions of Chatbot that end-users had experienced, two things attracted participants: appropriateness of response and fast processing of questions. This showed that Chatbot's functions met end-users' expectations in terms of online service support. Chatbot was able to solve the problems that end-users usually faced when interacting with humans in a traditional process. Instead of waiting for a certain amount of time, end-users now could receive responses quickly. Moreover, with the development of Chatbot, it provided suitable replies with appropriate manners that made end-users feel they were communicating with a person. The statistics presented actual situations in which customers were more confident in speaking to Chatbot. There was not as large a gap between the new technology and humans as there had been previously. Another aspect that received high percentages was the ability to process common speech. Firstly, it indicated an improvement in Chatbot's functions to handle requirements from customers. Secondly, there was a huge acceptance from customers towards changes to Chatbot. Chatbot had learnt and digested information sufficiently to release speech naturally as much as it could so that customers did not perceive a large gap between technological and human interaction.

The last two criteria that received the lowest percentages were awareness of context during conversation and being empathetic during interactions. This result was understandable because Chatbot had been in the process of developing and perfecting its functions. At that time, Chatbot could not play a main role in replacing humans completely since conversation and communication are complicated interactions. However, during the COVID-19 pandemic, customers had more opportunities to experience Chatbot, providing more reviews and asking for new requirements, so that Chatbot could handle more complicated conversations. In other words, it was acceptable for Chatbot

to receive this percentage of satisfaction regarding these two aspects in the meanwhile.

#### 4.5. Frequency of using Chatbot in COVID-19 pandemic

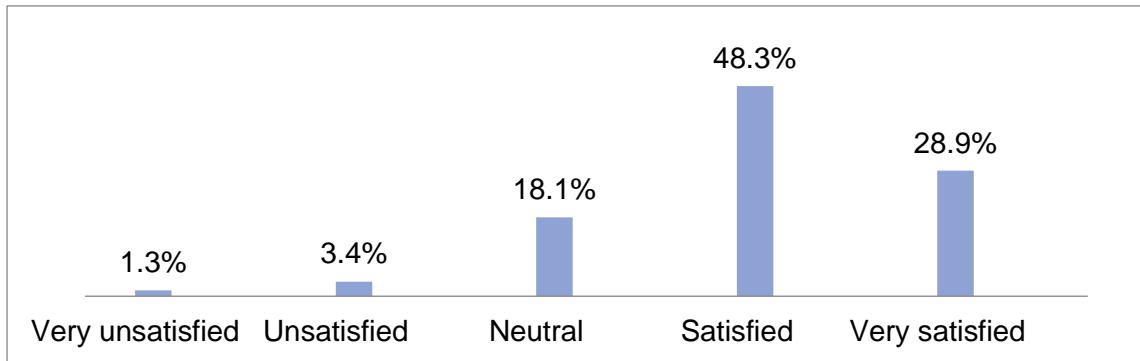
**Table 4.5.1 shows that the majority of participants used Chatbot during the COVID-19 pandemic.**

Rarely		Sometimes		Neutral		Often		Always	
6	4.0%	15	10.1%	18	12.1%	66	44.3%	44	29.5%

***Table 4.5.1 Frequency of Chatbot use in COVID-19 pandemic***

In particular, the highest level of ‘always’ use was 29.5% and the ‘often’ level accounted for 44.3%. The other levels presented lower percentages of 10.1% for ‘sometimes’ and only 4% for ‘rarely’. Even though the COVID-19 pandemic brought customers more opportunities to experience Chatbot, customers were satisfied with their conversation with Chatbot during this difficult period. A greater number of people used Chatbot for their concerns or asked for its support, accounting for nearly 50% of the total number of people who participated in the survey. Also, nearly one third of participants confirmed that they always used Chatbot for online services during the pandemic, leading to the fact that they achieved interest and satisfaction when using Chatbot. The next statistics show clear results for customer satisfaction.

#### 4.6. Customers' satisfaction when using Chatbot during COVID-19 pandemic



**Table 4.6.1** *Customer satisfaction when using Chatbot in COVID-19 pandemic*

From the statistics in Table 4.6.1, the percentages of ‘very unsatisfied’ and ‘unsatisfied’ levels accounted for a small number, at 1.3% and 3.4%, respectively. On the other hand, participants were mainly happy with the experience of using Chatbot, because 77.2% of people agreed and mentioned it in the survey. There was a small percentage (18.1%) of people that did not have particular interest in either using Chatbot or ordinary methods.

This shows that participants were quite happy with the services that Chatbot provided during the COVID-19 pandemic. Almost 50% of participants stated clearly that they were satisfied with Chatbot, and one third of them showed they were extremely happy with the new technology. Even though they had used Chatbot constantly during the short time of the pandemic, they found satisfaction with Chatbot’s functions that supported and clarified their concerns while they could not be present in the store in the traditional way. Regarding neutral reviews, there was a small percentage, which was not significant, since they also did not deny the important role of Chatbot. The rest of the reviews which showed as ‘unsatisfied’ occurred in less than 10 %. This was understandable as Chatbot was also in need of improvement and new functions to handle the greater requirements of end-users.

#### 4.7. Chatbot’s future required dimensions to satisfy customers’ expectations

There were suggestions of five dimensions of Chatbot for end-users to consider with respect to whether they would accept Chatbot for their needs in the future. These aspects were whether it was convenient, fast, supportive, responsive, and knowledgeable.

	Convenient	Fast	Supportive	Responsive	Knowledgeable
Dislike it very much	45.0%	45.0%	46.3%	47.0%	54.4%
Dislike it somewhat	40.9%	45.6%	38.3%	34.2%	29.5%
Neutral	10.7%	7.4%	8.7%	15.4%	9.4%
Like it somewhat	2.7%	1.3%	5.4%	2.0%	3.4%
Like it very much	0.7%	0.7%	1.3%	1.3%	3.4%

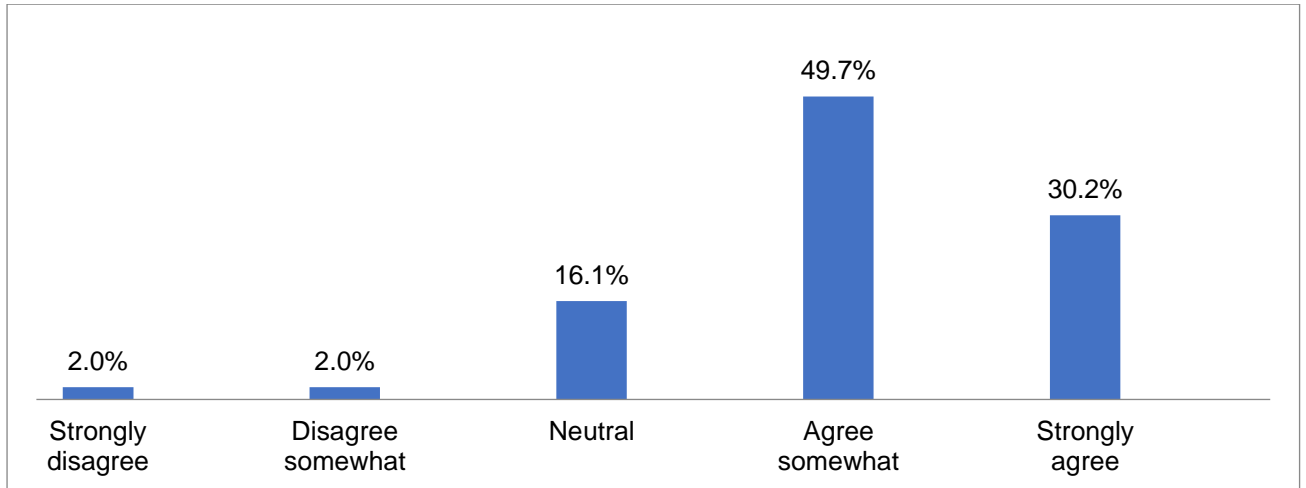
**Table 4.7. 1 Customer satisfaction and future functions of Chatbot**

In the summary in Table 4.7.1, the data showed high percentages in most of these aspects, at over 80%. In particular, the aspect of being ‘fast’ accounted for the highest percentage at 90.6%. Following that, the dimension of being ‘convenient, supportive and knowledgeable’ also received high percentages, at 85.9%, 84.6% and 83.9%, respectively. The aspect of responsiveness had the lowest percentage at 81.3%.

In general, participants showed their interest in Chatbot’s functions with their needs. That was why most of the criteria had widespread support and agreement from end-users. The end-users mostly preferred to use Chatbot because of its fast speed. They did not have to spend hours waiting in line to meet supporters or employees for simple concerns or queries. Instead, they could put the questions through the online service at their own convenient time. Therefore, convenience was the second-best aspect that end-users felt happy with when using Chatbot. They could proactively choose the appointed time they would like to solve the problems or ask a question without being concerned about the time. Additionally, being supportive and knowledgeable were two dimensions that became favorite parts of Chatbot that end-users would like to experience. The dimension that receives the least percentage compared with the others was responsiveness. This occurred because Chatbot might not know well all the queries and concerns of end-users. Therefore, Chatbot might need to find similar answers or responses before it could reply to customers. Regarding age of ‘dislike’ reviews, the data record showed a small percentage of feedback from customers that Chatbot did not bring significant support or useful functions for them to use. However, this number was negligible compared with most people who showed an interest in Chatbot.

#### 4.8. Recommendations about Chatbot to friends

Table 4.8.1 shows the results from participants about their willingness to recommend Chatbot to their friends in the future.



*Table 4.8. 1 Recommendations about Chatbot*

In general, many participants agreed to recommend Chatbot to their friends or colleagues, nearly 80%. Apart from this, 16.1% of participants left neutral views about recommending Chatbot. Regarding opposite views, there was only 4% of negative feedback about Chatbot and participants who would not recommend it to anyone.

During the COVID-19 pandemic, end-users seemed to be forced to use Chatbot for online services; thus, they had new opportunities to experience new technology with its modern functions. Table 4.8.1 presented that end-users had accepted Chatbot as a normal and supportive channel for them to gather new information and solve their issues, as well as to make clear their concerns. Therefore, it was understandable that they would like to introduce the advantages of Chatbot to their close relationships and apply it to their business in the future. This way they could improve their businesses as well as relationships. This is confirmation that customers are satisfied with Chatbot's functioning during the pandemic.

## 5. CONCLUSIONS AND RECOMMENDATIONS

Based on the responses of 149 people, most of them showed satisfaction with Chatbot when they had conversations with Chatbot, especially in the COVID-19 pandemic. They were from different genders and ages, however, the majority agreed that Chatbot's functions made them satisfied. Even though there was a certain number of people who had been using Chatbot for only a short period, their experiences were still relevant. Also, there were a small number of participants who did not appreciate the new technology of Chatbot. Another small number of people did not show their interest in Chatbot in particular. In general, however, Chatbot received positive feedback from participants. They also confirmed that they would recommend Chatbot to their friends and family or apply Chatbot to their businesses in the future.

The fundamental function of Chatbot is to provide support for customers in basic conversation and answering queries. The participants who had used Chatbot from three months up to a year accounted for more than 60%. This confirms that the number of customers reaching for Chatbot had increased significantly during the pandemic, which means Chatbot had played its role in providing necessary help for customers' concerns. More than 75% of people stated that they always or often used Chatbot. The feedback from customers about their first experience, responses, and speed of the conversation was positive. Most of the dimensions of Chatbot's functions were marked with high satisfaction, at more than 80%. Most participants were satisfied with their experiences with Chatbot during the pandemic. Approximately 50% stated they were satisfied and nearly 30% of other people confirmed that Chatbot met their maximum expectations. Based on the findings, Chatbot has been supporting customers in responding to their queries and balancing the conversation between customers and Chatbot so that they feel somehow as satisfied as when they speak to a human. Furthermore, the results showed the satisfaction of customers for all of the criteria even though each aspect had different feedback. Participants appreciated the speed of Chatbot, which was fast every time they contacted Chatbot, because this aspect had the highest percentage rating. Other criteria such as being supportive, responsive, and knowledgeable are also related to the benefits of Chatbot, which ultimately brings convenience to the end-user.

The questionnaires also raised several additional dimensions of Chatbot by collecting the feedback of participants on whether Chatbot's functions had improved to cope with the increased requirements from customers. The options included aspects such as appropriateness of response, awareness of the process of common speech, awareness of controlling conversations, being

empathetic during interactions, and the fast processing of questions. To conclude, participants who completed the questionnaires were satisfied with the current functions of Chatbot, especially the convenience, significant speed and prompt responses that Chatbot can provide to online services. Based on those findings, it is concluded that customers were satisfied with Chatbot's functioning during the COVID-19 pandemic.

## **5.1. Limitations**

Since the questionnaire was confined to Auckland City, New Zealand, the questionnaires were only collected in this one city. It would be more general and objective if the questionnaire were distributed in a larger size of population such as in wider New Zealand.

As mentioned previously, the respondents who received the questionnaires were IT employees or people who had knowledge about technologies at some stage. Therefore, most of them understood the fundamental information about Chatbot. The restriction of this questionnaire was that it was not able to approach other people who worked in other fields, so that the outcome would be more varied. Moreover, the survey only approached people who resided in Auckland City, New Zealand. For example, elderly people may prefer to show up in store directly instead of accessing the online service because they were not familiar with this new technology.

## **5.2. Recommendations**

From the findings above, there are several recommendations about Chatbot and its applications that people as well as enterprises should consider for their needs and businesses in the future, because Chatbot is able to provide significant advantages to satisfy end-users' expectations.

### **5.2.1. Recommendation 1**

Earlier, people were concerned about whether machines could replace humans. Even though there have been a few experiments in the past, most people were still afraid of this issue. However, during the COVID-19 pandemic, this was a great opportunity for new technology, like Chatbot, to be able to prove that a machine is now able to substitute for a human to handle their functions. One of the greatest advantages of Chatbot is that it learns by itself via actual conversations between end-users and Chatbot about any fields or industries. It will learn how to respond accurately, in an appropriate manner or with feelings, and so on. Because of the pandemic and its restrictions, people could not interact with supporters in the usual way. Instead, they used Chatbot to ask for support and answers to their queries. The more people



communicate with Chatbot, the better Chatbot can learn from them and perfect itself to be a smarter supporter.

Following from this, enterprises and industries should use and apply Chatbot to their businesses. It not only strengthens the services and networks of the businesses, but it is also a useful way to maintain the business when a pandemic occurs. Customers can contact the service either way, via online or direct support, without any disruption because Chatbot can play the role of supporter to handle issues and answer queries. Additionally, in terms of manpower, using Chatbot will be a good way for companies to save on costs during difficult times such as in a pandemic; moreover, the effectiveness of service remains.

### **5.2.2. Recommendation 2**

Through several findings about Chatbot's benefits and customer satisfaction, it is highly recommended that Chatbot should be applied widely, especially in the health field. Chatbot will be useful for both patients and doctors or the people in charge during unexpected situations like the COVID-19 pandemic. Instead of going to hospital to see doctors, people will be able to access the hospital's system and leave questions via Chatbot. Chatbot will play the role of doctors or nurses to respond to queries and learn from these conversations. Since Chatbot can learn from actual communication, it will be a chance for Chatbot to develop and improve its knowledge and information. From the hospital's point of view, it can reduce the burden from the overload in demand, particularly during a pandemic.

Another aspect related to Chatbot in the health industry is the consideration of applying Chatbot in emerging economies like China and Pakistan. Indeed, Chatbot should be implemented and used in those countries to expand support channels for people who are travelers and do not have specific places to meet doctors during a pandemic. It will be helpful and necessary for them to ask questions proactively and receive responses promptly, without any delay. With the large workload of local hospitals, travelers can present their status to supporters like Chatbot, understand quickly about their situation and whether it is serious or not, before they look for a suitable place to check with and meet proper doctors for in-depth advice or treatment.

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# **Analysis of the Impact of Machine Learning Automation on NZ Supermarkets**

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## **Abstract**

This research paper analyses the impact of ML and automation technology on supermarkets in NZ. The main objective of this study is to assess and analyse whether this automation technology is helpful in keeping customers happy and satisfied, because satisfaction is essential for customer retention, which leads to higher revenue. Self-checkout counters used in supermarkets are selected for the purpose of this research. This study has applied a mixed methods research approach and has used primary data to achieve its objective. Customers using these self-checkout machines were observed from afar to determine if they are able to use these machines without any complication or whether they needed to depend on the store staff to complete the transaction. If customers hesitate or are scared of using the machines, then the purpose of installing this technology fails at that point. After collecting data from supermarkets at different locations, it was observed that the customers have adapted to this technology well with a satisfaction share of 90.7% of observations and it is considered a great success for the supermarket business. This study argues that both male and female customers have adopted the automation technology. Similarly, all age groups have demonstrated confidence and satisfaction in automation transactions. This study may be of interest to researchers, academics, supermarket management and policy makers.

**Key words:** Technology, machine learning, automation, supermarket, New Zealand

## **1. Introduction**

Machine Learning (ML) technology and automation have transformed different industries to a great extent and now businesses are exploring new ways to use this technology for earning higher revenue (Hosek et al., 2017). Technological innovations are considered to contribute to greater productivity and growth (Cardona, Kretschmer, & Strobel, 2013). These technological innovations include Robotics Process Automation (RPA) which is basically

software enabling automation of business processes. RPA is beneficial as it increases productivity by adding speed to the checkout process and creates a reduction in cost by maintaining accuracy. Automation technology has extensive scope as it is not yet fully explored (Gami, Jetly, Mehta, & Patil, 2019). It has contributed to the development of software that can perform various human activities such as calculation, recording maintenance, data entry and collection, etc. It can even perform the complex tasks of auditing, reconciliation and analysis as well, which are often very time consuming (Moffitt, Rozario, & Vasarhelyi, 2018). Businesses and organisations can analyse processes and activities to identify efficiencies with the help of digital tools supported by ML and technology. It also helps in reducing the cost and workload of employees and bringing accuracy to task completion (Osman, 2019).

Although ML and automation technology are regularly proving their prowess in different fields, this research is carried out to identify the contribution of technology in supermarket businesses located in NZ. The supermarket industry has been present in the market since the early 1900s (Ellickson, 2011). IBISWorld (2020) mentioned that retail operators dealing with daily groceries, milk, meat, fruit, vegetables, canned products, toiletries and cleaning items come under the category of supermarket. Supermarkets understand the customers' daily necessities and act as a provider of essential items to customers. On average a customer visits a supermarket 1.6 times a week and spends approximately 43 minutes there ("FMI | Food Marketing Institute | Supermarket Facts," 2018). It is a \$21.5 billion industry in NZ, which is expected to grow with new advancements in technology. A common example of technology in supermarkets is self-checkout counters. The self-checkout counter allows customers to shop quickly without having to wait in long queues. This research has observed the impact of automated checkout counters on supermarket businesses in NZ with a view to analysing its impact on customer satisfaction.

The impact of this technology on the performance of supermarkets can now be determined by the sales and revenue of the stores, which are directly impacted by customer behaviour, satisfaction, perception and preference. It also enables observation of how customers interact with the machines and make their purchases. Hence to assess the impact of technology on supermarket businesses it is important to analyse the customer response to the technology. If customers accept self-checkout machines, this results in higher sales and revenue, and if customers reject the idea and stick to the traditional method of purchasing items, it consequently fails the purpose of installing the

self-checkout counters.

The main objective of this research is to explore the impact of ML and automation technology in NZ supermarket businesses. As is known, every business has a primary objective of accumulating high revenues for profit maximisation. High revenues are directly proportional to happy customers. This research has investigated how automation technology has impacted supermarket transactions, thereby impacting customer satisfaction, behaviour and loyalty to the store. These attributes therefore have a huge impact on the sales and earnings of a store. So, if a customer is satisfied and feels comfortable while shopping in a store, it usually indicates recurring visits. Customers expect quality service and convenient shopping from their stores. Hence a less complicated shopping atmosphere always attracts happy and satisfied customers.

## **2. Literature Review**

Turner and Szymkowiak (2019) revealed that customers want to stick to the staff- operated checkout counters. It was found that initially customers were motivated and eager to use the technology. However, when they used the technology, they found it more time-consuming and stressful. Customers also found it more impersonal as there were no staff involved. This study was carried out in two cities of Scotland (Glasgow and Dundee) where first-time users were examined. The primary objective of this study was to find the motivation behind customers using the technology. However, it presented the findings based on first-time use. Here all the results depended on the perception of the 31 respondents, and it did not talk about the global acceptability of technology. Also, the research was limited to only grocery stores in Scotland. Alternatively, the aim of my research is to check how this automation technology has made purchasing convenient for customers in New Zealand-based supermarkets.

Brougham et al. (2019) presented a different aspect of automation technology in business. They highlighted how employees encounter the changes related to automation, what their fears are, apprehensions and concerns about this change, and how they plan to adopt the technology. The authors analysed the responses received from 60 employees and found that although the employees were positive and confident about their future while working with technology, they also showcased a strong belief that the work they were currently doing would remain in the future. This shows optimism and a blind faith at the same time, as the fear of losing a job is kept completely out of the picture. The

findings of this research seem interesting, but they were related to the employees' beliefs and expectations. It did not meet the expectations of customers. It did not talk about the impact of automation on the business and whether it was favourable or not.

Lincoln et al. (2020) conducted a thorough study of customers, retail markets, automation and technology at POS (Point of Sale) and self-checkout counters in South Africa. This study covered the impact of self-service checkouts on customer attitude. Although the retail market of South Africa is most competitive, the use of automation to make the purchasing process easier for customers is not very popular amongst businesses. Only one retailer has utilised this technology as a trial, which has also not been welcomed by customers, as other stores were still following the traditional approach. This step also received huge condemnation from the public and government, as they considered it a major threat to existing jobs in the market. This study is mainly aimed at finding out the reasons behind opposing attitudes of customers and businesses towards automation. The authors wanted to find out why the technology was not being globally adapted by South African consumers and businesses. Hence, this paper was not able to capture the impact of technology on the supermarket businesses. Moreover, the paper does not cover the customers' perceptions about the technology and whether they find it convenient or too complicated.

Kwak (2017) come up with a new idea. He compared queue length and wait time in two different scenarios of traditional checkout counters and separate checkout counters. His findings were controversial as they revealed that the wait time on separate checkout counters is not shorter than the universal checkout counters. But the main reason behind this was stated to be the lag time. It was found that, with every additional server, the processing quality of all pooled servers degrades, which causes longer wait times. Also, the queues were generally shorter in separate checkout lanes but at times they also got longer because of pooling servers. This study helped in understanding the impact of technology on the performance of systems, but it did not discuss the impact of technology on business or whether the technology has been accepted by the customers or not.

Fernandes and Pedroso (2016) presented significant research on the use of self-checkouts. They analysed the effects of the quality of services provided by self-checkouts on customer satisfaction and retention in the retail industry. Their study was not about the acceptance of automation technology; rather it evaluated the effect of the technology on customer satisfaction and retention.



They studied the various attributes like speed, convenience, enjoyment and control and their relationship with service quality through the customers' eyes. It is very important to understand the customer's point of view towards service quality to determine level of satisfaction. Also, the authors explored different demographics and usage frequency to identify the connection between them and service quality. They also tried to figure out if customer satisfaction and customer loyalty towards the retailer bears any relation to the service quality delivered by self-checkouts.

### **3. Methodology and Research Design**

Out of two research methods, quantitative and qualitative, both seem appropriate for covering this research topic. Considering the research questions where impact of automation technology was to be assessed on supermarket transactions and customer behaviour, the findings were supposed to be subjective. They could not be grouped in numbers. Various attributes such as age, gender, complexity level of transaction, customer's response, etc. were assessed here. It was hard to quantify these findings. To address such issues, qualitative research methods serve the purpose of this study best as they capture the effects, gravity, and similar attributes of the data.

However, the research question also discusses the degree of convenience felt by the customers while using the technology. Though the data captured was in the form of subjective information it was quantified with the use of appropriate tools such as Likert scale. Here the customer reaction was measured in terms of satisfaction based on time taken, facial expression and involvement of staff assistance. If a customer left the counter without completing a purchase, it was considered very unsatisfactory. Similarly, if a customer called out for staff assistance repeatedly and took longer than the usual transaction (3 minutes per item), it was considered unsatisfactory. Alternatively, if a customer finished the transaction without staff assistance it was considered satisfactory. If the customer was smiling and looked confident during the purchase, however, it was considered very satisfactory.

Based on the previous information the number of satisfactory attempts were identified. This study also had to use the quantitative method for computing the success rate of machine usage. Considering the requirements of both qualitative and quantitative analysis included in the research questions, a mixed research method was adopted. As the name suggests, mixed methods is a combination of both quantitative and qualitative methods that enables the best out of the two methods (McKim, 2016). Creswell and Guetterman (2019)

stated that when both qualitative and quantitative methods were used together, it provided a better solution to one's research problem. If either one of them is not sufficient to bring comprehensive results, then a mixed research method should be adopted. A mixed research method is quite a flexible and accurate method covering the depth and breadth of both methods. It can combine strengths of both methods and overcomes shortcomings associated with either method.

As ML automation in the supermarket business is still a fresh concept which has not gained too much popularity so far, regarding data collection strategies it is important that the source of the information is selected wisely. Also, this subject is yet to be discovered fully, so it is difficult to find already published information on it. So, a lack of availability of existing data and information on this topic suggested that the information should be collected firsthand in this scenario. Hence, primary data was the basis for this research. Whenever the required data is not available to carry out the research, it is better to obtain the information firsthand. Primary data is more flexible and suits the need of the research project (Johannesson & Perjons, 2014). For data collection a supermarket with the availability of both automated checkout counters and staff operated checkout counters was selected. It is a renowned supermarket chain in New Zealand, which provides the best atmosphere to conduct this research. Different branches of this store were visited to cover customers from different locations.

A total of 150 observations were made for the analysis of the findings. This was a random sample because any person irrespective of age, gender or ethnicity who used the self-checkout counters during the study time was observed. However, because of the COVID-19 pandemic, the whole data collection process was very challenging. Due to strict rules created for the lockdown by the government, distance was to be maintained between people within the store. Consequently, stores with their entrance in a mall were selected. It was easy to observe the customers from just outside the store, as generally the self-scanning machines are installed near the entrance. The focus was on observing how customers responded to automated billing counters and identifying if the customer could finish the purchase on his own or if staff assistance was called for. A smooth completion of the transaction was considered where the customer was found to be either satisfied or very satisfied. Every customer reaction with the checkout counter was grouped into four categories: Very Unsatisfied Transaction (VUT), Unsatisfied Transaction (UT), Satisfied Transaction (ST) and Very Satisfied Transaction (VST). Customers who left the counter without completing the transaction in

frustration came under VUT. Customers who called out for staff assistance multiple times and took longer than the usual time (assumption is 3 minutes per item), were grouped under UT. Similarly, customers who finished their transaction without any staff assistance were categorised ST, and those who were smiling while processing were put under the VST category. Based on the frequency of each reaction it was to be decided whether the customers accepted the technology. Different attributes were observed with the complexity of the situation, gender, age group, time taken and smooth completion of the transaction as well. These findings helped in assessing whether these attributes had any impact on the customer's preferences or not. The business performance of these stores would be highly impacted if more customers approved of the use of technology. The study used the following model for analysis of the findings as shown in Figure 3.1.

#### 4. Analysis of Findings

##### (a) Characteristics of Data

Table 4.1 presents the composition of total observations in terms of gender. Out of a total of 150 customers observed, 48% were males and 52% were females.

*Table 4. 1: Gender Composition*

<b>Gender</b>	<b>Number</b>	<b>Percent (%)</b>
Male	72	48
Female	78	52
Total	150	100

This shows that the gender split of the customer population is quite balanced. Also, this factor does not influence the preference of customers in terms of self-checkout counters or staff-operated checkout counters. Almost equal numbers of males and females opted for the self-checkout counters. But there was a possibility that gender has impacted the way a customer responds to the self-checkout counters. To make a conclusion, further observations were studied.

##### **Age groups**

All customers were categorised into various age groups according to their appearance as observed. These age groups are presented in Table 4.2.

The first age group was 20 years or below which was 6.7% of total customers

(the lowest of all age groups). It was found that most of the people shopping were in the 41-45 years age group, which represents 26.7%.

This points toward an important finding that the age group which visited the stores the maximum number of times is 41-45 years. This is in general because this age group is responsible for most of the household grocery shopping. Similarly, 20 years or below was the group visiting the store the least number of times. The reason could be that there is less burden of household shopping on this age group.

**Table 4. 2: Age Groups**

<b>Age</b>	<b>Number</b>	<b>Percent (%)</b>
20 years or below	10	6.7
21- 25 years	21	14
26-30 years	31	20.7
31-35 years	18	12
36-40 years	18	12
41-45 years	40	26.7
46 Years +	12	8
Total	150	100

**(b) Findings**

**Customer satisfaction**

Similarly, customer reactions were also captured in terms of satisfaction. It helped in drawing a very meaningful conclusion about the overall satisfaction of customers for self-checkout counters. Here customer reactions were divided into four categories: very unsatisfied, unsatisfied, satisfied and very satisfied. Figure 4.1 represents the satisfaction level of customers according to the reaction they had.

As shown in the above figure, around 91% of customers had a satisfied customer experience. These people had very calm and relaxed facial expressions when they used the machines. There was no sign of stress and panic. The confidence people exhibited showed that they are comfortable around machines and were not hesitant at all of scanning through their purchases. This means the majority of customers have accepted the technology which is favourable for the stores’ sales.

Interestingly not a single person had the Very Unsatisfied experience as no one left the purchase incomplete or showed signs of anger. This shows that people

are patient and willing to complete their transaction. Only 3% of people were unsatisfied because their transaction was stopped in the middle because of some issue with the machines. Although the problems were resolved very quickly, it was not a smooth completion of purchase, and they were considered an unsatisfactory experience.

### **Store assistance required**

Another interesting observation indicated the number of people going for staff assistance. This is an important finding as it shows the dependence of customers on store employees. Table 4.3 captured the number of people who needed staff assistance to complete the transaction.

*Table 4. 3: Staff assistance required*

<b>Store assistance required</b>	<b>Number of people</b>	<b>Percent</b>
Yes	4	2.7
No	146	97.3
Total	150	100

Most of the people were able to finish their purchase on their own (around 97.3 %) with only 2.7% having to call for staff assistance. After looking into the detailed comments, it was found that this 2.7% includes the people who used their own bag or people whose system showed some error. This shows most of the customers can complete their transaction freely without depending on staff help. This could be because of two things: either customers are accustomed to the machines, or the interface used by machines is quite user-friendly which allows new customers to navigate easily. But both reasons are positive indicators that customers had no trouble using self-checkout counters. In conclusion, automation is bringing improved customer relations and improved sales.

### **Time taken**

Figure 4.2 presents the time taken by customers ranging from 1-20 minutes, depending on the complexity of the transaction in terms of number of the items. According to instructions on the store's signboards, 12 or less items are directed towards self-checkout counters. Hence, there were two categories formed for determining the complexity of transaction; a few items (which includes transactions involving less than 12 items) and many items (with more than 12 items purchased). Although the average time for completing one

transaction was decided to be 3 minutes, most of the people took only 2 minutes to finish their transaction. 22% of the total customer population was able to finish their transaction in just 2 minutes.

This figure also highlights the percentage of people finishing the transaction within that time range. An important finding indicates that more people were finishing their transactions in the range of 1-3 minutes, 48.6 % of the total customers. It shows that customers were confident and using machines with ease, indicating a higher level of acceptance for self-checkout machines.

### **Cross-comparison**

This segment shows the cross-comparison of two different variables. This comparison led to important discoveries about customer behaviour and their understanding of the whole idea of automation.

The complexity of the situation depends on the number of items purchased. According to the store's instructions, 12 items or less to be scanned were encouraged to use self-checkout machines. This could be because more items to be scanned means increased difficulty. Total number of items means an equal number of scans; hence a higher number of scans means higher possibility of issues or errors thrown. Therefore, two categories were formed depending on the items purchased: fewer items for the purchases of 12 or less than 12 items, and many items for more than 12 item purchases. Figure 4.3 presents the comparison of complexity with gender and age.

Females are seemingly more inclined towards transactions of a few items, whereas males have been engaged in both types equally. The chart above shows that around 67% of women shopped for a few items and the rest, 33%, went for more items. This could be because of the following reasons. First, they were primarily shopping for the short term; second, they prefer self-scanning booths over traditional checkouts and hence shopped for less than 12 items; and third, they did not want to shop with higher complexity. As to the men, they were not impacted by the complexity of the transaction. Also, it could be because they wanted to avoid long queues in the staff-operated checkout counters.

Another comparison in the figure above is about the complexity and age groups. This says that people in the age group of 20 or below and 46 years and above have chosen transactions with fewer items. Both age groups could be

less confident. This could be because when it comes to grocery shopping, most of the time people responsible for fulfilling the family's needs and necessities like to shop in bulk or in advance. This could mean more items in their cart. Generally, people in this category are in their mid-years. On the other hand, people in their 20s and 46 and above are not responsible for family expenditure and budget. Hence, they like to shop as and when it is needed.

### **Store assistance required with gender and age group categorisation**

Table 4.4 shows the comparison of gender and age groups in terms of store assistance required by them. This table demonstrates that approximately 97% of males and females did not require store assistance and were almost equally able to finish their purchase on their own. It means both males and females are confident and comfortable when it comes to using the self-scan counters. On the other hand, most of the age groups completed their transactions without any assistance. Store assistance was required for 31-35 and 46 years or above most of the time, which is approximately 19.5% when put together. It was observed that the reason for calling for assistance most of the time was because the machine was asking for a store login whenever customers used their own bags, or someone wanted to use cash to pay for the transactions.

***Table 4. 4: Store assistance required by different age groups and genders***

<b>Variables</b>	<b>Yes (%)</b>	<b>No (%)</b>
<b>Gender</b>		
Male	2.78	97.22
Female	2.56	97.44
<b>Age</b>		
20 years or below	0.00	100.00
21-25 years	0.00	100.00
26-30 years	3.23	96.77
31-35 years	11.11	88.89
36-40 years	0.00	100.00
41-45 years	0.00	100.00
46 years or above	8.33	91.67

### **Usage of time based on gender**

Figure 4.4 shown below reveals that most of the transactions were completed in the duration of 1-5 minutes by both males and females. Around 50% of males and 70% of females were able to finish their transactions in that duration.

There were transactions in the range of 16-20 minutes as well, but they belong to 9% of males and 5% of females. Also, those were transactions with many items, hence more time was taken. This comparison builds a true image of casual and calm transactions which are completed well on time. A high number of less duration transactions means the idea of bringing automation to customer use is successful and people are accepting it. However, comparison across genders suggests that more women are finishing the purchases in the time range of 1-5 minutes. The reason could be that females mostly do the grocery shopping for household needs.

### **Time usage by different age groups**

Figure 4.5 presented below portrays the time taken by different age groups. Although the actual time taken really varied from 1-20 minutes, for better presentation, time is grouped in ranges. For example, 1-5, 6-10, etc. This chart shows which age group completed the transaction in which time range. Most of the transactions were completed within 1-5 minutes and the age group of 20 years or below had the highest percentage of customers finishing it in 1-5 minutes. The highest percentage of customers who took around 6-10 minutes to complete the transaction, belong to the age group 36-40 years, which is 27.78%. The highest percentage of people finishing the transaction in 11-15 minutes falls in the age group 21-25 years. Mostly customers who finished their transaction in 16-20 minutes belonged to the 31-35 age group.

This figure also highlights that most of the customers in different age groups were able to finish their transactions in the 1–5-minute range. Very few customers took 16-20 minutes. It means people can finish the transactions efficiently and quickly and is great news for customers who want to save time.

## **5. Conclusions**

From the analysis in the previous section, it is evident from customers' responses observed while using machines that the technology is widely accepted by customers based on their satisfied and relaxed facial expressions. There was a satisfied response from 90.7% of customers, which means they were calm and relaxed, with no specific expression. Customers did not seem to be under any stress or tension while using the self-checkouts, which means they were open to the idea of scanning their items on their own. Some 6% of customers were so casual that they were enjoying music in the store, dancing or laughing. Only 3.3% of customers were unsatisfied as they had to call out for staff assistance during their transaction. They did not have to wait long to



get the issue resolved. There was another category in the observation sheet for a very unsatisfied customer response, but fortunately not a single customer had such an experience. This category was meant for customers who displayed anger because of trouble with the self-checkout machines. This shows that grocery shopping by using self-scanning machines is a normal routine for customers. Acceptance by the customers is a sign of a successful business for supermarkets in the future. A company's investment in technology shows the urge to serve customers with the finest quality service (Arora, 2019). Hence, the main purpose of the research was achieved after figuring out the positive impact of technology.

This study has achieved its objective by addressing the research questions. The impact of ML on customers, as discussed in the first research question, was found in terms of time saving, a boost in customer's self-confidence and customer engagement. They do not have to wait in queues behind people with full carts but can complete their shopping by using the self-scanning checkout machines. Also, according to the collected data, around 22% of the transactions were completed in just 2 minutes, which is the highest of all the transactions. On the other hand, if the transactions are grouped as per range of 1-5 minutes and so on, then around 62% of the transactions will fall in this time range. This shows huge time savings and keeps customers more involved and engaged as they were enjoying completing the scanning on their own. This automation has also allowed improved and efficient allocation of labour for more critical tasks. Store employees who were operating the checkout machines earlier can now be freed for other more significant activities bringing more order to daily store tasks.

Similarly, automation has impacted customer behaviour as well. It was observed that customers enjoy shopping through self-scanning machines. One customer brought her child and let him scan the items, which was quite engaging for both parties. One of the customers was dancing and smiling. It was generally observed that customers were happy about finishing their transaction on time. As 97% of the transactions were smoothly completed, this boosted the confidence of the customer. It generated a sense of self-reliance and accomplishment as they did not have to use staff assistance. It was observed that the machines were used by a variety of age groups which include people under 20 years and above 46 years. The automation was user friendly and developed a comfort zone for the people, hence customers were able to finish their transactions easily without any issue.

This research accomplished the purpose of identifying the impact of technology

on NZ-based supermarkets. Four different stores were visited to collect the data for this research, but these stores were in the Auckland region only. For a more comprehensive overview of technology and customer reaction, this research could have been carried out in other regions in NZ. That would have given a better presentation of customers' opinions and would have provided a more holistic view of customer behaviour and response to the technology.

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# Determinants of Cat Owners' Consumption Behaviour for Cat Services in Aotearoa New Zealand

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## Abstract

This research analysed cat owners' consumption behaviour about cat services by applying Bowlby's (1991) attachment theory, Maslow's (1943) hierarchy of needs, and Sheth's (1991) consumption values to discuss cat owners' internal and external factors that influence decision-making on cat services usage and the association with loyalty. An online questionnaire was conducted to collect quantitative data. Cat owners' (n = 381) responses were gathered and divided into 3 groups (group 1: a total of 381 responses; group 2: 322 completed responses; and group 3: 59 incomplete responses). Findings revealed that demographic data such as gender, age, marital status, or family status directly affect attachment between owners and cats and have a positive influence on their consumption patterns based on "the fulfilment of needs (H1)", "past purchase experience (H2)" and "information from social media (H3)". There are different levels of influence that are correlated to the loyalty of cat service noting the impacts on cat owners' consumption behaviour, cats' needs as the first factor, followed by past experiences and advice from social media as the last factor. Most cat owners solely utilise essential cat services such as veterinary, insurance, and cattery currently in Aotearoa New Zealand. There is high demand and an urge for improvement in cat-oriented grooming, cafés, dog-free parks, and others to increase their cats' satisfaction and safety. The research contributes to recommendations for city councils to be involved in creating more cat-oriented environments to meet owners' preferences and other animal welfare protection goals.

**Keywords:** cat ownership; consumption behaviour; Maslow's hierarchy of needs; consumption values

## 1. Introduction

Historically, scholars believed that cats were first considered as pets around 3,600 years ago. Cats played a role in family and state religion in Egypt based

on art and writing (Driscoll et al., 2009; Marshall, 2020). The genetic and archaeological discoveries show evidence of cat domestication in the Fertile Crescent around 10,000 years ago when humans engaged in agricultural activity (Baca et al., 2018; Driscoll et al., 2009). Cats have even become cultural icons with different meanings among countries (Marshall, 2020). In ancient Egypt, the Egyptians began to worship cats for religious reasons (Cucinelli, 2013). Cat images are now associated with the "Beckoning Cat" (招き猫 maneki neko) in Japan, and it is said to bring good luck (Mark Josh J., 2012). Indians are superstitious and see black cats as bad luck (Kazak, 2011). In ancient China, the nobility possessed cats as companions (Bodas Rucha Vijay, 2022), whereas lower castes kept cats as a practical means of pest control (The Guardian, 2013).

It can be generalised that the increasing cat population worldwide has resulted in human migrations. For example, cats on boats for vermin control (Lyons & Kurushima, 2012). Human's agricultural activity has led cats to cohabit with human societies, which gradually transformed new relationships with humans, and cats can be valued companions (Krajcarz et al., 2020). In 2020, an estimated 500 million cats worldwide (International Companion Animal Management Coalition, 2020). Cats have become one of the most popular companion pets worldwide nowadays, and even in some countries such as Japan, Aotearoa New Zealand, or within Europe, where cat ownership is higher than dog ownership (Nagasawa et al., 2020; Potter & Mills, 2015).

People's lifestyles have changed and their attitudes toward cats have changed compared to the past. Therefore, it reinforced the prosperity of the cat market. Like the boost to dog services, cat services have emerged and are unfolding in recent decades. The basic cat services include cat cattery, veterinary, insurance, and grooming, and then evolved to include cat travel services, training programmes, and animal communicators who assist owners to understand cats' feelings and thoughts (Kestenbaum, 2018). Apart from the huge consumption of domestic pets, stray cats are also helping the increase in business development. People are more concerned about cats' welfare, either domestic cats or feral cats. Many people feed stray cats and help those stray animals be desexed or rehomed. Those expenditures have contributed to part of the cat industry simultaneously.

The cat industry has seen explosive growth because people's lifestyles have been transformed by the ownership of cats. First, the increased late marriage rate of new generations can be identified as the cause of people's having pets. Despite following traditions to start a family and raise children, women now have more options for desirable lifestyles. Marriage or having children has become less of a responsibility and consideration during our lifetimes.

Choosing to have cats over having children is a popular option among females (Bhattacharai, 2016; Lee, 2019; Stone, 2017). Second, more countries around the world have been confronting low fertility rates. In developed countries such as the United States (US), Japan, or European countries. Fertility rates in developing countries, such as in India, are well below “replacement rates”. The late marriage rate or low fertility rate are relevant reasons why people own cats.

## **2. Background**

### **Cat Population and Business in Aotearoa New Zealand**

Companion animals like dogs and cats play a significant role in the lives of New Zealanders, with 64.4% of households having at least one companion animal (Skyner et al., 2020). In Aotearoa New Zealand, cat ownership in households has the highest rate, at 41% of households in any country in the world. Cats became more popular than dogs (34% dog ownership) (Farah Hancock, 2021). The statistic shows the average number of cats, about 1.5 cats per household in 2015 (Statista Research Department, 2015). There are 1.219 million cats in households, with an average number of cats per household of 1.7 in 2020 (Companion Animals in New Zealand 2020). Data shows that nearly half of households have at least one cat (New Zealand Immigration, 2022b).

The high percentage of the cat population means high potential in the cat market. The New Zealand Companion Animal Council (NZCAC) 2011 report showed that cat owners’ average cost was \$466 on food, veterinary, healthcare, and other items per cat a year (Richard Meadows, 2012). The cost has been continuously increasing. In 2015, NZCAC estimated that caring for a cat cost around \$670 (households with multiple cats) in food, veterinary care, and other services per year (New Zealand Immigration, 2022a). Findings indicated cat owners’ annual expenditure on cats included food, litter, accessories, healthcare, veterinary services, cattery, grooming, training, and insurance were \$459.6 million in 2010, and \$715.3 million in 2015 (The New Zealand Companion Animal Council Inc., 2011; The New Zealand Companion Animal Council Inc., 2016).

### **Concerns about Cat Services in Aotearoa New Zealand**

In terms of the increasing number of people who own cats, the cat industry has developed a wide range of services globally. While the owner-cat relationship is likely similar to a parent-child relationship, cat owners have become more meticulous when utilising cat services. However, cat services in Aotearoa New Zealand might not offer a great standard compared to the US, the United Kingdom (UK), Australia or some Asian countries. For example,

catteries are one of the cat markets that generate high profits in Aotearoa New Zealand, as they respond to the high frequency of travel of owners during holidays or special events. Many New Zealanders like to travel for holidays, particularly on the Christmas holiday. However, not all catteries can offer high-quality services or safe environments for cat clients. Poor and careless service can lead to cats' deaths, which is detrimental to the cat's wellbeing. Sad news such as cats died in a cattery due to careless service or unwell-trained staff delivered cats to wrong clients and caused cats' deaths (Laura Smith, 2021; Styles Rebecca, 2021). Most complaints are about cat care facilities with dirty premises, inadequate security, lack of supervision and veterinary care, or insufficient staff (Styles Rebecca, 2021).

### **Anti-Cat Voices in Aotearoa New Zealand**

Although cats have become the most popular pet in Aotearoa New Zealand, anti-cat voices complain about roaming cats as natural predators that kill millions of native wildlife, and they should be banned from going outside (Cooper Kelly-Leigh, 2018). Associations in many countries are striving to engage in the stray cat management policy to solve worldwide issues or implement a free-roaming cat policy (De Ruyver et al., 2021; Sumner et al., 2022). In Australia, the Australian Capital Territory (ACT) announced new cats obtained by owners in all Canberra suburbs will be required to be contained after July 1, 2022, (Midena Kate, 2021). Authorities like Victoria and the Adelaide Hills in South Australia prohibit owners from roaming their cats at night (Coë Charlie & Airs Kevins, 2022).

ANZCAC report revealed that 5% of cats are outdoor, 11% of cats are indoor, and most cats, at 85%, are both indoor and outdoor (Companion Animals in New Zealand 2020). To respond to anti-cat voices, some local councils are also increasingly introducing cat controls to protect native species (Dangerfield, 2021). Apart from advocating policies to ban roaming cats, many cat owners started to consider their cats' welfare and lock their cats inside houses or build catios to enable their cats to enjoy nature as well as create safe places, and cat owners have also transformed attitudes to treat their cats like children and refuse to let them out (Fallon Virginia, 2021).

Anti-cat voices about roaming cats' concerns have sparked inspiration. If the cat market could introduce more training programme services to Aotearoa New Zealand, to educate cat owners' attitudes like keeping cats indoors is sometimes beneficial for their safety (such as avoiding being killed by cars or dogs), or train cats to act like dogs to create possibilities like walking cats on the street with leashes or following owners' instructions. The cat service is not solely to provide essential needs for cat clients. Better understanding the

criteria of an owner's preferences can also enable businesses to modify or establish great services

### **Research Aims and Objectives**

Currently, there is no study related to cat owners' consumption of cat services in Aotearoa New Zealand. The aim of the research is to analyse pivotal determinants of cat owners' consumption behaviour about cat services, and the research result could support cat services' procedures for cat owners' usage.

Research objective:

- To find out the factors that influence a cat owner's consumption behaviour.

Research questions:

- What are the factors that influence an owner's cat service consumption decisions?

Sub-question:

- How do cat owners feel towards their cats' welfare?
- What are some cat services that are utilised by cat owners today?
- What influences an owner's decision to use specific cat services available to the owner?

### **3. Literature Review and Hypotheses**

The research context revolved around psychological perspectives to discuss attachment between owners and cats, and further correlated with influences on owners' consumption motives based on Maslow's (1943) hierarchy of needs and Sheth's (1991) consumption values. An identification of human needs came from Maslow's (1943) hierarchy of needs, a five-tier model of human needs within a pyramid that goes from the bottom, physiological needs, safety needs, social belonging, and self-esteem, to the top, self-actualisation. It emphasises the internal motives of consumers (McLeod, 2018). In human behaviour, when fundamental needs have been met for humans, they start to pursue and achieve higher levels of needs (Desmet & Fokkinga, 2020; Trivedi & Mehta, 2019). Cat owners' consumption behaviour can be a reflection that they think about more needs for their cats than essential needs quite often.

Bowlby's (1991) attachment theory addresses the effects of separation between infants and parents that are associated with anxiety, security, and closeness (Bowlby & Ainsworth, 1992). It is conducive to explaining the extent of the owner-cat relationship because cats are often considered like children from the owner's perspective. Conversely, animals also show attached behaviour or attitude in return (Schwarzmueller-Erber et al., 2020). Some studies indicate that it is difficult to observe the bond between owners



and cats, whereas some studies argue that cats do have a strong bond with owners (Ines et al., 2021). A feline specialist, Dr. Elizabeth Colleran, explained that the bond between cats and owners can be established in the kitten period and strengthened based on the length of cat ownership.

A customer's consumption journal relies on consumption value (TCV) that identifies consumers' behaviour through functional value, social value, emotional value, epistemic value, and conditional value (Sheth, 1991). When consumers evaluate a product or service, they weigh its perceived value against the asking price. Cat owners consume many cat services, mostly influenced by Sheth's (1991) consumption values theory.

### ***Owner-Cat relationship***

Domestic cats have become companion pets for thousands of years (Roetman et al., 2018). Many studies show cats can help to improve the quality of life, enhance mood, and encourage physical activity for humans (McConnell et al., 2011; McDonald et al., 2021). For example, a survey conducted in the UK has shown evidence pets mitigated negative psychological effects during the pandemic (McDonald et al., 2021; Ratschen et al., 2020). Additionally, cats provide good support for social health simultaneously (Ines et al., 2021; Nagasawa et al., 2020). An interesting standpoint is that the selection of pet types might reflect a person's personality. People who have cats seem to rarely engage in social activities and keep aloof from the community. That is similar to cats' solitary and aloof lifestyles. When owners are exposed to social isolation or rejection, pet cats can provide more benefits to owners, providing a more critical form of social support than human friends (McConnell et al., 2011).

In general, dogs are the most popular pets, whereas the cat population has grown to exceed and also become the most popular companion pet in Japan and European countries (Nagasawa et al., 2020; Potter & Mills, 2015). For the increasing cat population in Aotearoa New Zealand, there might be more restrictions on having dogs, or other reasons such as in rental properties where cats are easier to negotiate than dogs. Moreover, advanced veterinary care means cats can live longer. The longer ownership enables owners to be more concerned about their cats' or even older cats' wellbeing (Littlewood et al., 2021). When the relationship between owners and cats is transformed into a relationship like that between parents and children, it forms intimacy. For example, psychological reactions such as anxiety and avoidant attachment have penetrated completely because cats have been regarded as anthropomorphic subjects unconsciously (Zilcha-Mano et al., 2011). And cats

display distinct attachments to human caregivers like infants to parents.

### ***Consumption Pattern of Owners***

While the owner-cat relationship changes, owners prefer to offer the greatest life for cats and protect cats' wellbeing, and their consumption intentions have been frequently inspected. It is not only cat owners' internal motives of purchase being more reliant on the consideration of their cat's wellbeing but also impacted by external motives of purchase, such as owners' personal experiences or acquiring and consulting substantial information or recommendations via online or other physical platforms (Autio et al., 2014).

### ***The Fulfilment of Needs***

Dr. Elizabeth Colleran applied Maslow's (1943) hierarchy of needs to extend to recognising cats' needs and discovering cats' needs are not limited to food or shelter (Colleran, 2017). Different needs such as self-satisfaction, bonding attachment practise with people, and skills development are also required. In consumption behaviour, Maslow (1943) highly emphasised the significance of the internal motive amongst consumers. Different levels of owner-cat attachment may influence owners' considerations of cats' needs. For example, neurotic owners are more concerned about everything cat-related, such as outdoor access security, health, and so on (Finka et al., 2019). Meanwhile, given the extent of the hierarchy of needs for cats, the length of cat ownership is also one of the factors that impacts owners' consumption decisions when accessing diverse cat services.

### ***Past Purchase Experiences***

Due to technological advancement, today's market has more diversity than traditional markets. Substantial unknown products or services have created the difficulty of purchasing intention. Experience-based emotions increasingly influence decision-making when accessing products or services (Savelli et al., 2019). Marketing researchers and practitioners suggest that the economy is an experience economy; consumers often make future decisions according to retrospective or actual experiences (Milena S Nikolova, 2009). The value of products or services is determined by the direct personal experiences of buyers' self-valuation (Fu, 2018), and this impacts consumer consumption decisions next time. Additionally, product or services' providers could rely on consumers' past experiences to establish or maintain brand equity or brand trust (Weisberg et al., 2011).

### ***Information from Social Media***

Advanced technologies have accelerated the application and popularity of social media in recent decades. A study shows that three billion people are

using social media at least once a month (Studen & Tiberius, 2020). Since social media has been utilised frequently, the knowledge or information released on social media impacts people's purchase intentions (Radziszewska, 2021). Users' consumption experiences shift from passive to active (Duan & Dholakia, 2017).

People prefer WOM advertising because they trust information about products or services from people who have already used or accessed them (Duan & Dholakia, 2017; PR Newswire, 2016). Social media offers a new means of marketing and allows users to engage in online activities. It is the common reason for the use of social media to acquire information that could positively impact a consumer's purchase intention, demonstrating high values among consumers (Bakar et al., 2021).

### ***Consumption Values***

In marketing theory, Sheth's (1991) consumption values theory identifies the motivation of consumers' purchasing behaviour (Tanrikulu, 2021). Consumer perceived value is not limited to the price of products or services but also has a range affected by psychological factors (Zhang et al., 2021). A five-dimensional model includes functional value, social value, emotional value, epistemic value, and conditional value to provide a concrete fundamental establishment of the consumer perceived value scale. Sheth's (1991) consumption values theory is also related to the awareness of protection of animals' wellbeing.

People are more willing to care for animals and are more likely to contribute. In addition to treating domestic cats, there are some groups of people who do not own cats (called "semi-owners") who also feed cats, especially stray or roaming cats. This is commonly seen in Australia, Ireland, Italy, Thailand, and the US (Zito et al., 2015). While semi-owners provide similar types of care to cats, cat owners are more likely than semi-owners to interact with cats (Zito et al., 2015). It is beneficial to create consumption values in the owner-cat relationship.

### ***The Emergence of Cat Services***

Studies show that cat owners consider their cats a priority and spend money on them, even if they are confronting economic hardship (Muniappan et al., 2018). Regarding the owner-cat relationship as the extent of the parent-child relationship, diversities of business designs and activities follow the trend to meet owners' expectations. For example, many facilities have extended other services such as training and grooming to further attract owners to use them (Pet Care Market Size, Research & Trends | Industry Report, 2018-2025,

2018).

The huge cat population is holding a critical market share in the pet industry. Because cats are more sensitive animals. They sometimes show behavioural problems of aggression or sickness. Less activeness, decreased appetite, or reluctance to use litter when facing environmental change or access to unfamiliar caregivers (Grigg & Kogan, 2019; Stella et al., 2013). Cat services require more delicate and comfortable environments for cat clients. Traditionally, service design is directly based on consumers' experiences and offers to acquire sustainable competitive advantage as well as further increase brand equity in the market (Autio et al., 2014; Chaney et al., 2018; Teixeira et al., 2012). According to the pet industry's features, those service providers wholly understand the owner's viewpoints on service types. They understand the decision on pet service design is not limited to the interaction with owners. Sensitive cats are also clearly independent actors, and their presentation of feelings and emotions during service experiences has a huge impact on the owner's feelings, activities, and the value of the experience (Autio et al., 2014).

Three hypotheses have been created to examine cat owners' decision-making on cat service usage.

***H1: The fulfilment of needs is a significant determinant to impact on a cat owner's consuming decision for cat services.***

Most consumption decisions (making or motivating) are based on needs. The research applied Maslow's (1943) hierarchy of needs to identify the cat's needs. It is also to be discussed that consumption behaviour is to meet consumers' needs simultaneously, especially in terms of psychology. Consumers' psychological needs for satisfaction are the strongest predictors of product or service purchase intention (Tröger et al., 2021).

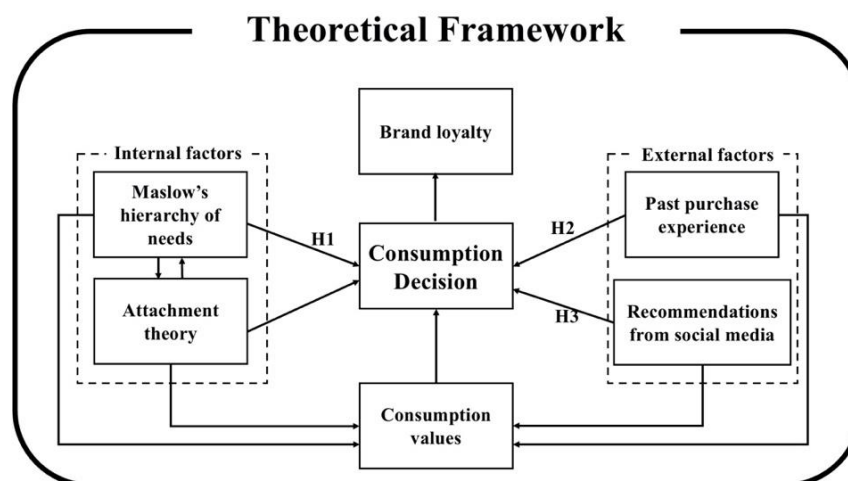
***H2: Past purchase experiences have a significant impact on a cat owner's purchasing decision for cat services.***

Cat service depends more on past purchase experiences quite often. There are diverse cat service businesses in Aotearoa New Zealand that provide different levels of quality of service that are probably not suitable for each cat owner. Furthermore, cats as clients without the capacity to express their feelings. Hence, actual experiences could enable cat owners to evaluate their cat's emotions and reflect on them to recognise satisfaction with the service. Besides, past purchase experience also helps cat owners to acquire more information and put adequate options on the list rather than browsing various

cat service information on the website pages without any clues.

***H3: Information from social media is a significant determinant for impacting cat owners' consumption decisions for cat services.***

There are diverse cat service businesses across Aotearoa New Zealand. Plenty of advertisements on television and websites have increased the difficulty of choosing the best option for cat owners. Joining cat communities online has become a major trend where cat owners can share any useful cat service information. Recommendations about the vet, catteries, and medication considerations will be exchanged. Especially for the beginner who just has a cat and has no knowledge or information. To understand the owner's decision-making for cat-related service consumption, it could be divided into internal and external factors. Based on the diagram of hypotheses and theoretical framework (Figure 1), internal factors such as Maslow's (1943) hierarchy of needs and Bowlby's (1991) attachment theory are examined to discover the owners' behaviour from a psychological and emotional perspective. While external factors like the owner's past purchase experience and recommendations via social media can influence the owner's decision-making. Both these factors are also present in Sheth's (1991) consumption values, determine consumption decisions, and then form the loyalty of cat service providers in the long run.



**Figure 1 Diagram of Theoretical Framework and Hypotheses**

**Research Methods**

This research employed a quantitative approach from a positivist lens that was deductive in nature for theory development purposes. An online questionnaire created from the "SurveyCake" software platform was published to cat owners' communities from 1<sup>st</sup> May to 22<sup>nd</sup> May 2022 in Aotearoa New

Zealand and gathered quantitative data, with 381 responses, to generate findings that were relevant and achieved the research objectives. The online questionnaire was published and collected within cat communities, either via Facebook or physical access.

IBM SPSS statistics were utilised for data analysis to explain variables that were designed in questionnaires. The measurement criteria for each variable were items rated on a 5-point scale. On a Likert-type scale (1 = strongly agree, 2 = agree, 3 = neither agree nor disagree, 4 = disagree, 5 = strongly disagree). A factor analysis provided descriptive statistics and went through principal component analysis to explain variables in-depth and extract lower values of variables that enabled the remaining variables to be explained effectively. Meanwhile, Pearson correlation (Isaac & Chikweru, 2018) was used to compare correlations among variables to examine influences on cat owners' consumption behaviour as well as make comparisons in differences of determinants that affect consumption decision-making.

#### **4. Findings and Discussions**

A total of 381 responses were gathered, including 322 responses that fully completed all statements and 59 responses that were not filled out adequately. Among 59 incomplete responses, there was only 1 respondent who refrained from the questionnaire questions, and 58 responses were considered filled out, having skipped some statements unintentionally. This data remained under consideration and provided valuable evidence. Therefore, it was divided into three datasets to analyse (group 1 = a total of 381 responses; group 2 = 322 completed responses; group 3 = 59 incomplete responses) and observed if there were similarities and differences. IBM SPSS statistics were applied to examine all datasets. A factor analysis was used to explain the attachment between owners and cats. Three determinants, so-called hypotheses, that influence cat owners' consumption attitudes and behaviour were tested.

##### ***Demographics Data***

Three groups of data have many features in common, while some have slight differences (figure 2). The majority of participants in three groups who were involved in the online questionnaire were females, with over 80% of participation. The result of age range in group 1, most participants' age range is located between 26 to 35 years old and 36 to 45 years old. And the age range group from 36 to 45 years old had the largest number therein, with 31.4% and followed by the age range group from 26 to 35 years old, with 28.6%. The same results are represented in groups 2 and 3.

In the annual income category, among three groups, around one-third of participants earn over \$72,000 annually, and around two-thirds of participants' annual income is evenly spread from under \$44,096 to \$72,000. The occupation categories in groups 1 and 2 are more concentrated in educators, the financial industry, hospitality, the IT industry, and medical institutions. In group 3, it is located in the hospitality and IT industry. Therein, one-third of participants who selected other options found that students, retirement, and manager positions were the top three, amongst other options.

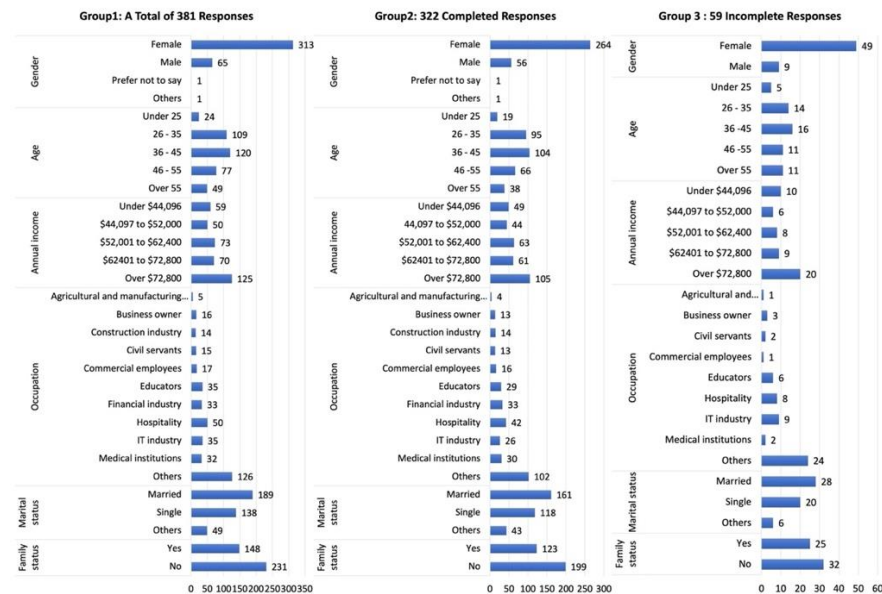


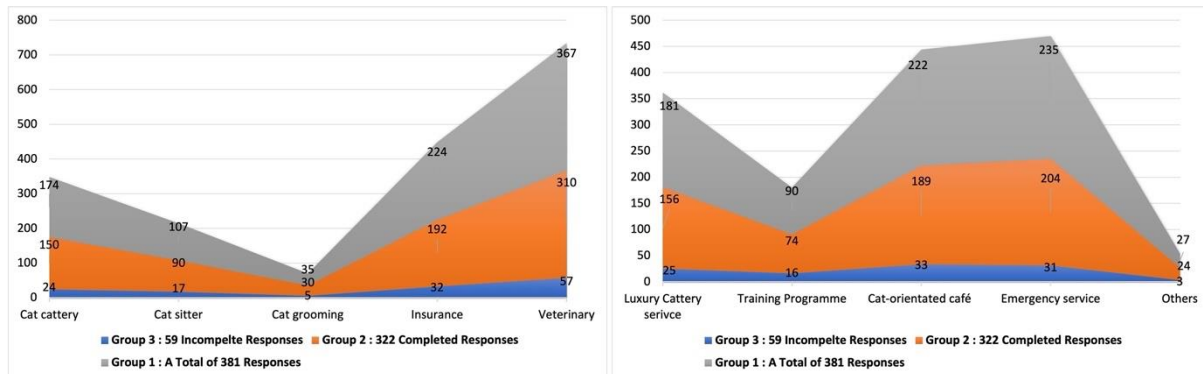
Figure 2 Demographic Information of Online Questionnaire Participation

### *Cat Services Usage and Desires for Future*

Figure 3 on the left depicts current cat owner cat service utilisation in Aotearoa New Zealand. Group 1 indicates that cat owners often use veterinary services, with 96.3%, over 50% of participants utilise insurance (58.8%) and catteries (45.7%). Groups 1 and 3 showed similar results. As demonstrated, cat grooming is less popular amongst cat owners.

Figure 3 right showed participants' desires for other cat services to be introduced or improved. Five categories, including luxury cattery, training programme, cat-oriented café, emergency service, and others. Group 1 shows that 61.7% of participants require more emergency services. 58.39% of participants prefer cat-oriented cafés where owners can bring their cats on-site to meet new friends to share experiences of products, services, or any information that fellows seek for special celebration purposes. 47.5% of participants demanded a luxury cattery that could offer real-time monitoring, spa service, and so forth. The training programme was the least option, with

23.6% of participants needed. The outcome of group 2 is the same. However, group 3 indicates that a cat-oriented café is the first selection and is followed by emergency service.



**Figure 3 Current Cat Services Usage and Future Desires**

Some participants provided valuable cat service ideas to the research. For example, people prefer "home service" where service providers offer feeding, cleaning, or other services when owners are away; day care service; more pick-up service from home to service centre; or cat eatable food production like cakes for special events. Additionally, a dog-free park requires the city council's involvement.

### ***Attachment between Owners and Cats***

Testing of owners' and cats' attachments. Most participants in three groups strongly agreed with questionnaire questions given. It proved that Bowlby's (1991) attachment theory was adequately applied to the owner-cat relationship, which is solid.

### ***Determinants of Consumption Behaviour***

The impact of cat owners' consumption behaviour was examined, and three hypotheses were analysed and explained. First, "the fulfilment of needs (H1)": all groups presented the same results amongst participants. The questionnaire was designed according to Maslow's (1943) hierarchy of needs, dividing all questions into five tiers of needs. Most participants are more concerned about safety and esteem needs than physiological needs. They want their cats to be more confident or satisfied with cat services. The result can be classified as most participants earning a higher income and being willing to seek and pay more for premium services. In terms of self-actualisation needs, some participants refused training programme service as they considered their cats independent and had the freedom to keep natural habits. Secondly, participants' "past purchase experiences (H2)": groups 1 and 2 showed that



the majority of participants are familiar with cat service providers that they often use or know how to recognise the quality that cat service providers offer to their cat clients. Thirdly, “Information from social media (H3)”: the major results in all groups showed that most cat owners agree with the acquisition of cat service providers from social media platforms such as Facebook cat communities, because they have a high probability of receiving prompt and useful advice from other owners. Nevertheless, traditional advertisements on TV, in newspapers on new cat services are not wholly trusted. Over 90% of female participants rejected this question.

### ***Cat Owners’ Loyalty to Cat Services***

The research also examined participants’ loyalty to cat service providers. It contained four options, including "cat service quality", "personal experience", "others’ recommendations", and "cat’s reactions" that were provided to participants to rank the reasons impacting their loyalty to cat service providers from 1 to 4. Three groups are presenting similar results. Overall, "cat’s reactions" was ranked in the top 1, "cat service quality" was ranked in 2, "personal experiences" was ranked as 3, and "others’ recommendations" was ranked as the final place.

### ***Data Examination***

#### ***Principal Component Analysis (PCA)***

The first principal component analysis of attachment between owners and cats was conducted. Results in three groups, most variables’ component values were higher than 0.5, which can be interpreted. Further testing of three factors (hypotheses). First, “the fulfilment of needs (H1)”: fourteen variables were divided into five-tier levels. In groups 1 and 2, five variables were deducted out of fourteen items due to lower component values of 0.5; in group 3, participants would like to utilise training programme services for their cats. It can be generalised that this determinant has a positive impact on a cat owner’s consumption behaviour. Second, “past purchase experiences (H2)”: three groups representing five variables’ component values were higher than 0.5 and solely one variable, "I will try new cat service to seek a better one for future" below 0.5. After analysing the data, it could be concluded that cat owners’ past purchase experiences have a positive influence on decision-making for cat services. Third, the principal component analysis conducted for “information from social media (H3)” identified the same results in all groups. The component value in the first variable, "I trust any advertisements for cat services on TV, in newspapers, etc." was under 0.5.

#### ***Total Variance and Reliability Analysis***

In the analysis of attachment between owners and cats, a cumulative rate of 58.558% is shown in group 1, and 49.694% is shown in group 2. In group 3,

the cumulative rate reached 67.688%. In the discussion of three factors. In “the fulfilment of needs (H1)”: the cumulative rates of three groups are 57.705%, 64.971%, and 64.146%, respectively. “Past purchase experiences (H2)” in three groups, with cumulative rates of 72.475%, 73.694%, and 53.127%. The cumulative rates represented 77.499%, 77.367%, and 78.528% within three groups in “information from social media (H3)”. Testing of owner and cat attachment for ground support, and three determinants that impact cat owners’ consumption behaviour by the factor analysis. Then a reliability test was conducted and represented among the three groups. Based on scale testing, four categories’ reliability tests were all between 0.8 and 1, that is, those data showed valuable results, and all values can be used for further research.

### ***Pearson Correlation***

The table below shows the application of Pearson correlation to examine owner-cat attachment (Ave.) and three factors (hypotheses) (Ave.). It also tested correlations between the former variables and demographic data. Overall, relationships among variables had significant correlations (have \*\* of values) among groups 1 and 2, as those absolute values are presented, whether positive or negative. Furthermore, it represented gender, age, marital status, and the length of cat ownership presented more significant correlations, whereas family status had fewer correlations with past purchase experiences (Ave.) and information from social media (Ave.).

Table Pearson Correlations Among Variables

	Ave. Owner and cat attachment	Ave. The fulfilment of needs	Ave. Past purchase experiences	Ave. Information from social media	Gender	Age	Marital status	Family status	The length of cat ownership
Ave. Owner and cat attachment	1								
Ave. The fulfilment of needs	.471**	1							
	.473**								
	.564**								
Ave. Past purchase experiences	.400**	.681**	1						
	.413**	.617**							
	.402**	.791**							
Ave. Information from social media	.239**	.520**	.479**	1					
	.235**	.528**	.470**						
	.348**	.556**	.569**						
Gender	.349**	.269**	.160**	.186**	1				
	.344**	.282**	.152**	.210**					
	.355*	X	X	X					
Age	-.117**	-.150**	-.148**	X	-.156**	1			
	-.116**	-.191**	-.166**	X	-.145**				
	X	X	X	.320*	X				
Marital status	X	.129*	.180**	.215**	X	-.155*	1		
	X	.133*	.188**	.199**	X	-.168*			
	X	X	X	.313*	X	X			
Family status	X	X	.120**	.170**	X	-.382*	.366**	1	
	X	X	X	.167**	X	-.358*	.370**		
	X	X	.316*	X	X	-.449*	.335**		
The length of cat ownership	-.134**	-.153**	-.188**	X	-.162**	.477**	-.179**	-.256*	1
	-.149**	-.224**	-.245**	X	-.150**	.423**	-.205**	-.231*	
	X	X	X	X	X	.720**	X	-.373*	

Notes:

Blue : group 1: a total of 381 responses

Purple : group 2: 322 completed responses

Green : group 3: 59 incomplete responses

\*\* = have strong correlations; \* = have less correlations

X : have no correlations

## Discussion

The online questionnaire embraced diverse questions to match and analyse the research objectives. It was designed with procedures to first gather participants' demographic data, and then to understand the owner-cat relationship, and finally, involved in the core part, prompt answers about diverse variables to prove hypotheses, to know if there were positive impacts on cat owners' decision-making towards cat services. Indeed, it was conducive to acquire a comprehensive spectrum for the research's main question as well

as sub-questions.

Most female participants are the main caregivers, as in human nature, a mother as the main caregiver to children. This demonstrates that Bowlby's (1991) attachment theory is applicable in an owner-cat relationship. Nonetheless, marital status and family status had no correlation with attachment. It was interesting to see that participants who did not have children had more cats than those who did. It is commonly assumed that child-free individuals or families must have a strong attachment to match the research background that people see cats as anthropomorphic animals for companionship or to fill loneliness, whereas Pearson correlations analysis revealed the contrary result.

Findings outlined that most participants earn more income annually. It believes that participants spend more on cats per month based on the strong bond between owners and cats. However, there were no particular figures outlining cat owners' spending habits. It is supposed that current cat services in Aotearoa New Zealand have not been developed as quickly and well as in other countries. Cat owners obviously do not have a choice and only rely on essential services such as veterinary, insurance, and cattery so far. The online questionnaire gained the extent of suggestions for other cat-oriented services that should be improved or be established that corresponded to concerns that the researcher introduced from the beginning of the research. It is generally agreed that the improvement of cat services' categories and some participants' preferences, like cat-friendly rentals and dog-free parks, need policymakers' and regional councils' efforts to achieve those desires for cat owners.

The most significant findings are to gain more evidence to support the three hypotheses and the presented theoretical framework (figure 1) that have significant impacts on cat owners' consumption behaviour. In H1, data results indicated physiological needs are not a major concern among owners as they prefer to select higher quality service providers despite cheaper prices or proximity concerns that prove they take cats' wellbeing as a priority. In H2, consumption behaviours are influenced by the experienced economy. Many cat owners recall special moments with their cats provided by cat service providers, which trigger emotional value and further brand loyalty unconsciously. In H3, participants rely more on enquiring advice from social media and reject traditional advertisements. It demonstrates that the power of the online brand community has a significant impact on participants' decisions about cat service providers. The testing results of brand loyalty of cat services also showed different levels that impacted owners' decision-making within three hypotheses. Here it came up with the conclusion that cat owners'

consumption behaviour is most impacted by “the fulfilment of needs (H1)”, and followed by “past purchase experiences (H2)”, “information from social media (H3)” has the last impact compared to other determinants.

### **Limitations of Research**

There were some limitations that occurred during the research, including questionnaire design, methodology, and technique issues that required attention. First, questionnaire design is a significant stage that leads to success or vice versa. Owner-cat relationships and consumption behaviour have diverse complexities. According to online data collection, critiques and recommendations from participants realised that it requires a pre-test and might require more perspectives from others to ensure the perfect design of a questionnaire and reduce ambiguities. Second, mixed methodologies might be suitable for data collection.

Due to the Covid-19 pandemic, the research decision was made to utilise quantitative research. Nonetheless, during the data analysis procedure, it was realised that although quantitative research can acquire sufficient data, qualitative research like interviews is helpful to understand cat owners' in-depth ideas about cat services. Because cat owners see cats as family members, whereas they demonstrate diverse levels of intimacy with their cats. It is critical for guidance to impact their consumption behaviour among the determinants that were discussed in the research. Third, when examining the data collected, it discovered 59 incomplete responses, meaning that participants missed some questions unintentionally. A comprehensive understanding of the "SurveyCake" software is required. For example, technically set up the limitation that participants require to exactly answer a questionnaire question and then continue on going to the next question to ensure 100% feedback on each questionnaire and further increase the accuracy of figures.

### **Recommendations**

This online questionnaire was completed by over 80% of female participants, which solely acquires subjective findings of female consumption behaviour without objective perspectives from male participants' responses. In practice, males' consumption behaviours are remarkably differentiated from females. Females' consuming attitudes are based on emotional value, as the findings found in the research, while males usually consume with rationality. Therefore, it would be beneficial to acquire more male participants' responses and to commence more comparisons about similarity or differences between female and male cat owners in further research. In addition, Aotearoa New Zealand is full of cultural diversity as many migrants come from Europe, the

Middle East, India, China, and other countries. The country has a diverse culture. Data collection covering ethnicity might yield more interesting results about ethnicities' consumption attitudes and behaviours toward cat services.

### **Future Research Opportunities**

This research analysed cat owners' consumption behaviour in Aotearoa New Zealand. There is potential to conduct similar research in other countries. In particular, the Western and Eastern cultures have different perspectives on how they treat their cats. More interesting findings could be discovered in future research opportunities. It would be conducive to receiving more valuable and different perspectives if it used other languages in questionnaire design, like the researchers' mother tongue, Mandarin, and understanding Japanese. It may create more opportunities to conduct research in Taiwan or Japan, or with a global perspective that requires wide-range data usage.

### **5. Conclusion**

This research emphasised the psychological perspective to analyse cat owners' attitudes from an understanding of levels of bond between owners and cats, and then deeply observed in detail three factors that influence an owner's cat service consumption decisions. Three factors: "the fulfilment of needs (H1)", "past purchase experience (H2)", and "information from social media (H3)" represent internal and external impacts that guide cat owners' decisions toward cat services. The majority of datasets demonstrated effective variance and full reliability, implying that all questionnaire questions (variables) could be explained and interpreted. According to demographic data, it can be generalised that gender is a critical criterion that strongly proves three hypotheses. Over 80% of female participants as caregivers to their cats are mirrored as caregivers to their children.

To analyse the research objective, more information is needed among cat owners. Therefore, sub-questions were designed to support the research questions. Firstly, how cat owners feel about their cats' wellbeing. The research topic is associated with cat services, most findings showed that cat owners who participated in the online questionnaire do concern their cats' wellbeing. Focus on safe environments and being careful about cats' emotions, which are correlated to health, are generally major considerations among cat owners when selecting cat services.

Secondly, what kind of cat services do cat owners use now? Findings revealed

that most cat owners have no options and can only utilise essential cat services such as veterinary, insurance, and cattery often because Aotearoa New Zealand lacks sufficient cat-related services developed recently. For further enquiries, many cat owners prefer more services like luxury catteries, cat-oriented cafés to bring their cats and make friends, exchange information, or cheaper 27/4 remote online medical consultations. When commencing a street survey, to the researcher's astonishment, some cat owners solely provide the essential needs for their cats and do not exactly know about other services such as hotel-like catteries mixed with different services offered in other countries. Participants who heard that information expressed they would like to try those services if they were introduced to the country.

Finally, what influences whether owners use specific cat services? When discussing “the fulfilment of needs (H1)”, variables that related to security, safety, health, and emotion received stronger agree and disagree answers, meaning the above elements are significant to an owner's decision-making when accessing specific cat services. Cat owners' consumption behaviour occurred based on the variant weights of impacts. “The fulfilment of needs (H1) “is the first and is followed by personal “past purchase experiences (H2)” and “information from social media (H3)” as the last impact. Loyalty to cat services had the same sequence within three determinants.

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## Perception towards attending online events

# during COVID-19 in New Zealand

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## **Abstract**

The COVID-19 pandemic has impacted severely on people and organisations, pushing them to move dramatically online. Digital solutions have played a huge role in keeping people in touch and companies running during all the social distancing measures imposed to mitigate the spread of the virus. The event industry has seen events cancelled or postponed as a direct result of the pandemic and is being pushed to change its ways to plan and hold events in order to not run over the COVID-19 mitigation challenges. The purpose of this study is to find the perception of New Zealand users on attending online events during the COVID-19 pandemic. By answering voluntarily and anonymously, 198 respondents across the country answered 28 questions from an online survey. The results show that both corporate and entertainment events were attended by most of the participants; and they were considered excellent. Mobility compatibility is the favourite feature between online attendees, while accessibility is most beneficial in attending an online event. However, most participants faced technical glitches during an online event and not being able to interact with other event participants made up the highest percentage of dislikes when attending online. According to the findings provided by the study, the negative perception about interaction among participants can reduce positive perceptions towards future intentions to attend online events or even the level of recommendation of events.

**Keywords:** COVID-19, Online Events, Events Disruption, New Zealand Events

## **1. Introduction**

### **Global Event Industry**

The essence of events is the creation of space for social interaction. As defined by Salem, Jones and Morgan (2004, p. 19) “events are a unique blend of activities, which are the tool for achieving the overall event aims and satisfying customer needs”. However, Van der Wagen (2007) describes events as “a complex social endeavour characterised by sophisticated planning with a fixed deadline, often involving numerous stakeholders”. According to

Dolasinski, Roberts, Reynolds and Johanson (2020), events are temporary gatherings that consist of four essential factors: time, participants, organised activity and unique experiences that result in people interacting with each other. Interaction and socialisation are motivators for individuals to attend an event, and they influence participants' experience directly (Nordvall, Petterson, Svensson & Brown, 2014).

The number of events has increased worldwide due to their multiple different opportunities; as a result, event management businesses have seen several economic benefits by promoting gatherings with various purposes (Thakur, Kadam & Deshmukh, 2022). Thakur et al. (2022) also stated that events have been separated into segments: corporate events & seminars, exhibitions & conferences, festivals, sports, and music concerts. Furthermore, Dolasinski et al. (2020) stated that events are divided into 20 types each separated into four categories: professional field: meetings, conferences, conventions, congresses, trade shows, academics; entertainment field: incentive travel, expositions, exhibitions, festivals, sports, fans, concerts; social field: milestones, family celebrations, ethnic/ cultural and common case field: summits, rallies, spiritual & religious and commemorative. Regardless of the type or size, the events industry is a multi-faceted supply chain involving several professionals who depend on the industry for their livelihood.

In addition, factors such as theme, size, legal requirements, the volume of media coverage and the capacity to host and attract several visitors are also a way to differentiate types of events (Global Edu, 2017). According to Global Edu (2017), size is a common way to categorise events by dividing them into four main dimensions: mega-events, hallmark events, major events, and special events. Mega-events affect countries worldwide, having international media coverage, for instance, World Cups and Olympics, that attract participants domestically and from different locations, generating a substantial favourable profile for the host country (New Zealand Government, 2022). Meanwhile, special events that are sporting, cultural, tourism and corporate events are local and smaller scale being categorised by purpose as a unique moment in time with ceremonies and rituals to satisfy specific needs (Global Edu, 2017).

### **COVID-19 pandemic effect on the Global Events Industry**

The COVID-19 pandemic has caused tremendous pressure and dramatic effects on numerous industries. Event organisers have said that the events industry was the first to stop and will be the last to recover (Kilgallon, 2020). This negative impact has been the consequence of mitigating the outbreak of

the virus through unprecedented lockdowns, travel bans, restrictions on social meetings or any physical gatherings, and enforcement of social distancing measures (Research Dive Analysis, 2021). Apart from substantial revenue losses, event businesses have been forced to postpone, reschedule, or cancel events and lay off staff (Almeida, Santos & Monteiro, 2020). According to the Global Association of the Exhibition Industry (2020), by March 2020 the global event industry had lost more than \$16 billion, and 90% of event professionals had reported that some or most of their business had disappeared (Event MB, 2020).

One of the viable solutions has been technology. The COVID-19 pandemic has required change and new ways to overcome social distancing, and virtual formats have become the solution to overcoming these constraints. According to EventMB (2020), three-quarters of event planners have become more proficient in technology due to the COVID-19 pandemic. Without delivering in-person events, businesses have been helped by technological advancements and initiatives to recover from this health crisis by implementing new options based on digital technologies and redesigning event planning and management (Almeida et al., 2020).

Furthermore, the ban on social gatherings affected traditional ways of fostering businesses to shift towards virtual events (Research Dive Analysis, 2021). Due to challenges imposed by social distancing for an industry that depends on human integration, the solution has been to incorporate the flexibility from digital platforms providing consumers with a model of event that is flexible to their needs as well as keeping attendees safe (Almeida et al., 2020). Almeida et al. (2020, p. 99) state that “digitisation enables organisations to establish their operations globally, especially through faster communication and shared services”. The popularity of virtual events has steadily increased due to various possibilities to recreate the traditional events experience.

### **Event Industry in New Zealand**

In New Zealand (NZ), the event industry has played a crucial role in positive social and economic outcomes as well as being an important industry for New Zealander’s livelihoods. Event is a broad sector that runs in all regions of NZ, involving plenty of professionals, organisers, agencies, suppliers, venues, and service providers. New Zealand Government (2021) separates events into three types, mega, major, and regional, responsible for attracting domestic and international attendees, generating substantial international media interest, and boosting community spirit that has long-lasting outcomes for NZ. Furthermore, the event industry plays a pivotal role in increasing cross-

cultural awareness, generating national and global media profiles, and positive economic impacts such as employment, income, and expenditure (New Zealand Association, 2020).

The New Zealand Event Association (2020) stated that before the COVID-19 pandemic hit, thousands of events were happening in NZ, playing an essential role in impacting Gross National Product (GDP), delivering an average of at least \$1 billion to NZ's economy per annum. According to Business Events Industry Aotearoa (2020), the number of events realised in NZ between October to December of 2021 decreased by 48% compared to the same period in 2020. The impact of the pandemic on the events industry has been the most long-lasting; many organisations that are part of the industry's supply chain have seen a 100% decline in activity and revenue since the first governmental restrictions in March 2020 banning mass gatherings (Business Events Industry Aotearoa, 2020).

### **Online Events**

Held events through web-based solutions have become increasingly popular within the event industry. Event organisers and organisations are adhering to, migrating, or mixing digital platforms to deliver events. While events are confined to limited time and space, online events are defined as this limited time and play in the online dimension through virtual interaction (Simons, 2018). As a result of increased integration between digital devices and the physical world, the event industry has expanded its capability to hold and reach audiences across the globe via the internet. Dolasinski et al. (2020) argue that online events are a fast-growing trend that can replace old event formats or be part of them, mixing in-person and virtual attendance, when possible, via hybrid events. As part of business strategy, event management businesses have advanced and adapted technology in their production to enhance their competitive advantage, boosting customer experience, new digital solutions, new capabilities, and platforms (Sox, Kline, Crews, Strick, & Campbell, 2015). Delivering online events has become a new way of doing business within the event industry. Hoods and Pakarinen (2018) pointed out that traditional event management has adopted new ways to deliver social interactions by combining traditional elements and new and innovative technologies such as live streaming, webinars, and web coaching. It has been seen that event management businesses worldwide have increased interest in seeking new ways to introduce online event formats through technology.

Along with the natural online event phenomenon, the COVID-19 pandemic has fostered the event industry to move online. Due to social distancing protocols, travel bans, and lockdowns, event management businesses were



forced to seek new solutions to maintain business continuity by providing scheduled events, which had been organised in in-person format and organising future events. As pointed out by Statista (2021), the event market has experienced and explored digital solutions to engage their consumers; for instance, exhibitions companies have been moved online, with one-fifth of trade shows globally being organised as digital events in 2021, while one-third of trade shows were held as hybrid events. In addition, marketers are projecting that 40% of their events will be held virtually (Statista, 2021). Online events have been a crucial option for event management events to allow attendees to attend from a safe place. That is to say; online events have been a great example of how the event industry has adapted to the current environment, providing ways for people to stay connected and entertained by staying home.

### **Problem Statement**

Due to all imposed measures to control and mitigate the COVID-19 pandemic, many events have been rescheduled, postponed, or cancelled across NZ. Among the countless difficulties the COVID-19 pandemic has brought, event management businesses have rethought how to reach and engage NZ participants to host a successful online event. Consequently, digital consumers now represent an integral part of events, requiring that event planning and management businesses change their strategies to successfully organise and promote events. The efficacy of online events is determined mainly by how the participants think about their experience attending remotely; however, only a few studies are related to online events held in NZ. That means a lack of awareness and information regarding how digital consumers think about online event experiences during the COVID-19 pandemic and the subsequent impact on future behavioural intentions towards these events.

The study will answer the following research question:

*What are New Zealanders' perceptions of attending online events during the Covid-19 pandemic?*

This study aims to achieve the following research objectives:

- To examine the New Zealand attendee's perceptions about online events during the COVID-19 pandemic.
- To provide recommendations to businesses to improve their event planning and management in future events.

### **Significance of Study**

This study's findings will be significant to New Zealanders and the event

industry, considering this research will expand the current understanding of users' perceptions of this new phenomenon of moving online due to a global health crisis. Online events were already becoming popular; however, the COVID-19 pandemic has been a trigger to become not just an emergency solution, but it has increasingly become the new normal. From an event industry perspective, this study will benefit organisers and event management businesses across NZ by providing insights into users' perceptions of online events. This research will also develop knowledge to identify what people think about the online events format and whether expectations are met. Furthermore, this study may motivate other customer-focused experience studies to improve user experience in attending online events in NZ.

## **2. Literature Review**

### **Events and economy**

Events play an essential role in the local economy and the quality of life for citizens (Coles et al., 2022). Events have a multi-role in attracting participants to attend the event itself and provide economic benefits to the region holding the event. Lee and Chang (2017) stated that events have become one of the fastest-growing areas in the hospitality and tourism industries in the last decades. That is because of the power of events to foster economic wellbeing and promote places.

According to New Zealand Event Association (2020), events in NZ were cancelled or postponed in 2020, resulting in a gross profit loss of about \$100 million. The COVID-19 pandemic restrictions such as lockdowns and social distancing protocols caused businesses that rely on physical contact to reduce their operations, reducing profitability, services, and efficiency (Papadopoulos, Baltas & Balta, 2020). Furthermore, the entertainment field such as the arts and recreation sectors have suffered, with people being reluctant to attend in-person mass gatherings, consumer behaviour in general has changed, but also people are stuck at home or relying on the internet for communication, resulting in a loss more than 9,000 creative jobs in cultural and sporting events, for example, (Whiteford & Olsen, 2020).

Also highlighted by Madray (2020), due to reduced revenue and capital shortage, event management businesses are restructuring their operations to keep running by exploring digital solutions. As event organisations and workers in the industry have faced reduced or no income because of COVID-19 restrictions and been forced to ask for financial support from the NZ Government. According to Charge.org (2022), more than 30,000 signatures were collected; and in 2022 the NZ Government announced the event

transition support payment (ETSP) scheme that was designed to support event businesses and organisations, with at least 200 attendees, to maintain planning and deliver events over 2022/2023 (Ministry of Business, Innovation and Employment, 2022).

### **Events moving online**

According to Dolasinski et al. (2020), watching events from the screen has been fast-growing; however, it is not a new concept. Virtual delivery has been seen since the 1970s through sports events. One of the essential features of virtual events is their accessibility. It has been seen that online events have become a source of interest in different sectors, including education and entertainment, due to globalisation and the need for virtual or hybrid events that enable participants to attend from anywhere (Koetsier, 2020). By eliminating travel and accommodation expenditures, online events attract people with lower finances, making a format more inclusive, apart from promoting more power dynamics among participants during activities, for instance, debates, reducing bias and toxic behaviour (Foramitti, Drews, Klein & Konc, 2021). Another reason online events had become increasingly popular even before COVID-19 is their low carbon footprint, being 94% less than in-person events (Tao, Steckel, Klemes, & You, 2021). Apart from the positive environmental aspect, online events have some benefits, such as promoting inclusion and societal outreach (Foramitti et al., 2021).

Priyono, Moin, and Putri (2020) state that exploring digital solutions through new platforms and technologies is a positive solution for businesses responding to the COVID-19 crisis. Unprecedented situations lead to substantial opportunities, for instance, new formats to connect people, which have been influenced by the various types of technologies that enable the design and delivery of events with a mix of in-person and online elements (Kim, 2021). McKinsey (2020) stated that the improvement of digital capabilities should be a limited view of operating and an end-to-end new perspective of the business model. Due to the uncertain situation, the event industry had to find solutions while New Zealanders were in isolation, by implementing internet-enhanced events as well as boosting its resilience in order to recover from COVID-19 disruptions (Cotton, 2021).

As stated also by Scholten, Scott and Fynes (2019), resilience is the capability to adapt and recover from unexpected situations, such as pandemics, by identifying strategies to react and keep operating by minimising the impact of disruptions. Kochan and Nowicki (2018) define resilience as a capability that enables organisations to resist, recover and respond with effective solutions. Consequently, the event industry has changed and accelerated the process of

adherence to transformational technologies to create an alternative experience due to the unprecedented circumstances brought about by the global coronavirus crisis (Wreford, Willian & Ferdinand, 2019). Once online platforms come to support organisations to run their event businesses, planning, execution, and evaluation of event performance will change as well, starting from rethinking big gatherings by analysing how the online event will be funded, monetized, and marketed, through technological planning (Rubinger, Gazendam, Ekhtiari, Nucci, Payne, Johal, Khanduja & Bhandari, 2020).

Ray and Madden (2021) state that moving events online begins with how organisations communicate to promote virtual gathering using websites, emails, and social media. These tools will govern how attractive online events such as scientific and academic conferences will be. Geigenmüller (2010) states that trade fairs and exhibitions have moved to online platforms in recent years for numerous reasons. Some of them are because of cost-savings and flexibility for exhibitors and visitors to participate in events regardless of their time zone and location. Tanner (2002) pointed out that trade fairs are crucial for fostering relationship-building among brands and partners and are an effective channel to improve the brand's sales efforts and monitor competitors. It is also a great facilitator for organisations to enter the market. Other types of events, such as trade fairs and exhibitions, had to move quickly to online platforms for organisations to keep in touch with their customers and straighten business relationships with partners (Geigenmüller, 2010).

### **Event attendees' perceptions**

Experiences are central to events, even though the measurement of these experiences remains a significant challenge (Biaett & Richards, 2020). Events have, as a foundation, delivery of experiences that requires every detail of the project to be analysed and planned carefully. As stated by Kuiper and Smit (2014, p. 29), "experience is an intrinsic process that occurs inside of individuals who receives the experience. It means that user experience in events is complex in nature that "depends on the individual, the situation and the service offerings" (Liu, Sparks & Coghlan, 2016, p. 42).

Chen, Singh, Ozturk and Makki (2014) point out that attendees' interactions to a planned activity define the participant's experience during an event. For this reason, hosting an event involves a broad assessment of the attendee profile, conceptualising the event, and the organisation of features, services, and experience delivered. All these details are part of event management that ensures that the event achieves quality determined by the performance of service offered by the organiser that is analysed subjectively based on

participant perceptions (Braker & Crompton, 2000). As Parasuraman (1985) discussed, to achieve service quality, the supplier should prioritise addressing and satisfying customer needs, covering expectations and perceptions. However, multiple positive and negative stimuli can be experienced at an event, requiring that event businesses plan and reinforce attendees' event experience into valued moments. When a virtual environment substitutes the traditional event format, event features such as interaction and communication are redesigned. Other details are disregarded as the quality of facilities cannot be transferred to an online event. Kharouf, Biscaia, Garcia-Perez and Hickman (2020) concluded in their study that interaction among participants, customisation, content engagement and effective communication in an online event will interfere directly towards future behavioural intentions to attend events and their positive online customer satisfaction.

According to Seidenberg, Scheffel, Kovanovic, Lynch and Drachsler (2021), moving online has changed the perceived value of events built by individual interests, needs and perceptions. Furthermore, as Beardsley (2015) stated, comprehending the participants' perceptions enables organisers to optimise time, effort, and spending that impact overall satisfaction, creating more value. All types of events require preparation and forecasting that will enable organisers to meet attendees' expectations and needs. Regarding scientific conferences, for example, organizers can increase the diversity of speakers in a conference as well as an online conference can be a more democratic space for "new researchers to present their work or even attend top-quality seminars (Valenti, Fortuna, Barillari, Cannone, Boccuni & Iavicoli, 2021).

According to Rubinger et al. (2020), to organise an online meeting or conference, there are best practices that should be followed, divided into four cycles before planning a virtual event, called PrePARE. In this framework, the authors cover actions and preparation that involve event type, technology, monetisation and marketing, and engagement strategies. Especially, when the online event is held to share and exchange knowledge, as for example conferences, seminars or workshops, there are five principles of learning that should be considered, whether virtual or face-to-face, as discussed in the study by Hofstädter-Thalmann, Rotgans, Perez and Nordquist (2021). The researchers pointed out the five principles: prior knowledge, context-dependent memory, situation interest, knowledge organisation and elaboration and active construction of meaning.

Understanding user perspective helps the organisers to plan online events by considering the quality of event experience to meet with the service quality that is a central aspect of part of the event industry (Armbrecht, 2020).

### **Future of Online Events**

According to Trustradius (2021), more than 60% of organisations are planning to invest in web platforms to host events to deliver increasingly online events that were fostered by the pandemic, but it was already an upcoming trend. In addition, by 2026, the video conferencing market is expected to surpass USD 50 billion globally (Market and Markets, 2022), and in 2022 is estimated to grow by \$9.7 billion in the United States alone (Molla, 2011).

According to LinkedIn (2022), 85% of Europe, the Middle East and Africa event organisers agree that online events will be for the long term due to their benefits offering global access to participants and content creators and reducing the stress of travel for all involved. Consequently, it is expected that live video will increase 15-fold by 2022, reaching 17% of all internet traffic (Cisco, 2020). Furthermore, according to Kaltura (2021), 92% of event businesses have moved to online events, with 94% planning to produce in 2022 and 48% planning to host in 2023, while 93% of attendees have felt that organisers have done an excellent job in moving to online, with 73% satisfied with the online event experience. Another figure pointed out by Kaltura (2021) is that before the COVID-19 pandemic, 45% of interviewees attended online events; however, this number has jumped to 87% since the start of the COVID-19 crisis.

### **3. Research Methodology**

In this study, descriptive survey research is conducted to answer the research questions and meet its objectives. According to Williams (2007), descriptive research aims to describe the current circumstance of the factor that is being studied. Kelley, Clark, Brown and Sitzia (2003) stated that this type of research aims to estimate specific parameters in a particular population. Descriptive research uses quantitative methods to describe, record, analyse and interpret conditions without the researcher manipulating any of the variables (Siedlecki, 2020). Furthermore, descriptive research was chosen because this type of research is the most effective way of describing phenomena or events that are new or recently known (Dulock, 1993). In other words, descriptive research was chosen to represent the perceptions of people toward moving events online by observing and describing the online attendees in NZ.

This research is conducted through a survey investigation due to its cost-effective way of obtaining input from a large group in a relatively short time frame. In this study, participants will answer a set of questions in a predetermined order through an electronic questionnaire. Surveys provide a

unique means of data collection from life experiences, enabling us to identify people's perceptions in a natural setting. Online questionnaires have been widely recognised as an efficient and fast method, with high anonymity for participants and less biasing error than interviews (Tajvidi & Karami, 2015). According to Bahsin (2019), a survey is one of the most popular and easy ways to collect data by distributing the survey to random people to obtain their opinions.

This study used a quantitative method. The quantitative approach will obtain more excellent knowledge and understanding of what was affecting people during the COVID-19 pandemic. Quantitative research was chosen to quantify and analyse variables to obtain the research's objective. Apuke (2017) states that quantitative analysis consists of gathering data in numeral form through statistical techniques ideal for a large and random sampling size.

### **Data Collection**

The research will take place in NZ, involving collecting primary data from participants through online questionnaires. This research utilises Google Forms to collect primary data, where the questions are administered electronically using the internet. According to Edwards (2020), Google Forms is a cloud-based platform that simply shares the questionnaire through a link that can be sent by emails, text messages, social media, and multiplatform messaging apps such as WhatsApp and Telegram. In addition, web-survey tools like Google Forms have advantages of being handy in designing, developing, and collecting responses in a more straightforward way than traditional questionnaire tools such as face-to-face surveys and telephonic interviewing methods (Raju & Harinarayana, 2016). Electronic questionnaires have increasingly become popular due to their convenience. They provide features that can support researchers in preventing errors during the data collection and be efficient in data management (Topp & Paw, 2002). A link for the questionnaire will be sent to participants via email and other digital means of communication such as WhatsApp and Facebook.

### **Questionnaire design**

Brace and Bolton (2022) state that a questionnaire is a channel of communication between the researcher and the targeted population through articulated questions to obtain desired answers. This study uses closed-ended questions that have a limited set of fixed answers and are often used to describe the participant's attributes, beliefs, and attitudes (O'Leary & Israel, 2015). The 30 questions will take around 15-20 minutes. The questionnaire in this study

was adapted by using Akuratiya and Meddage (2020), Business Events (2021), Kim (2021) and Thangavel (2020) as references.

### **Sampling Technique and Sample Size**

As this study needs a statistical quality for the survey, a sample size calculation is required. According to Kelley et al. (2003), random samplings enable studies to achieve findings by generating a more significant population through statistical analysis. Random sampling is employed in this research to collect data by questionnaire. Random sampling, also called probability sampling, has the greatest freedom from bias, as everyone in the interested population has the same chance of being included in the sample (Taherdoost, 2020).

The online survey questionnaire was sent to individuals 18 years old or above across NZ in this study. According to Statis (2021), the population of NZ is estimated at 5,122,600; and the population aged 18 and older is estimated at 3,999,752 (IBISWorld, 2021), who are those who may attend events. According to the sample size calculator (2022), the sampling size will be 196 participants. The sampling size considered the confidence level to be 95%, and the margin of error is set to 7, see Figure 1.

The image shows a web-based calculator titled "Determine Sample Size". It features several input fields and buttons. The "Confidence Level" is set to 95% (indicated by a blue radio button). The "Confidence Interval" is set to 7. The "Population" is set to 3999752. Below these fields are two buttons: "Calculate" and "Clear". At the bottom, the "Sample size needed" is displayed as 196.

Parameter	Value
Confidence Level	95%
Confidence Interval	7
Population	3999752
Sample size needed	196

***Figure 1. Research Sample Size (Creative Research System, 2022)***



## **Data Analysis**

Data analysis is one of the most crucial areas in any research, once underlying patterns, trends, or relationships are revealed, helping the study's conclusions (Albers, 2017). In quantitative analysis, it is not about number crunching, but it is about a way of analysing with critical thinking numerical data.

In this study, the descriptive statistics will interpret, describe, and summarise in a meaningful way the primary data gathered by using Tableau Software and Microsoft Excel. This study provides data visualisation through tabulated format, for instance, tables and graphical descriptions such as graphs and charts that will help to convert numbers into visual form to make them simpler to understand (Halsey, 2019). With data cleaning, which will be part of data analysis, incomplete, incorrect, or irrelevant data will be detected and modified, replaced or even deleted (Chu, Ilyas, Krishman & Wang, 2016).

Furthermore, Kaushik and Mathur (2014) provide a descriptive statistic to help researchers to summarise in a simple way the sample and the observations that they have made over a study. Statistics is a scientific method where information is collected and analysed that will be interpreted with the purpose of description of a circumstance.

## **4. Findings**

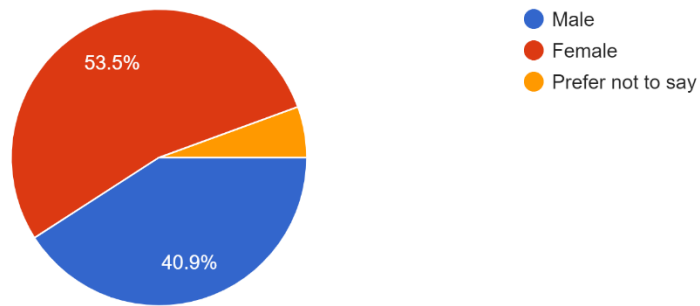
In this study, 198 responses were collected using Google Form. The online survey consisted of demographic information from participants, such as gender, age, study background and profession, representing eight questions. For those who have attended online, the online survey had a total of 28 questions, while for those who have not participated, had a total of 11 questions.

## Demographic analysis

### Gender

The proportion of females was 53.4% of the participants, while males made up 40.9%. (See Figure 2)

What is your gender?  
198 responses

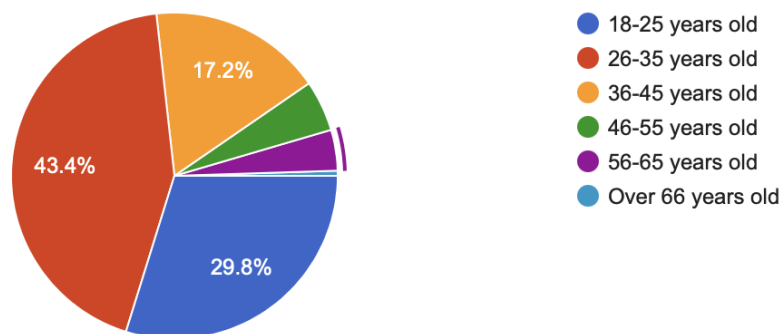


*Figure 2. Participant gender*

### Age

Most participants were in the age group of 26- to 35-year-olds, followed by the 18- to 25-year-old group. The 36–45-year-old group made up 17.2%, while the 46-55 years, and the 56-65 years accounted for 5.1% and 4%, respectively. The study collected answers from one individual over 66 years old (see Figure 3).

What is your age group?  
198 responses



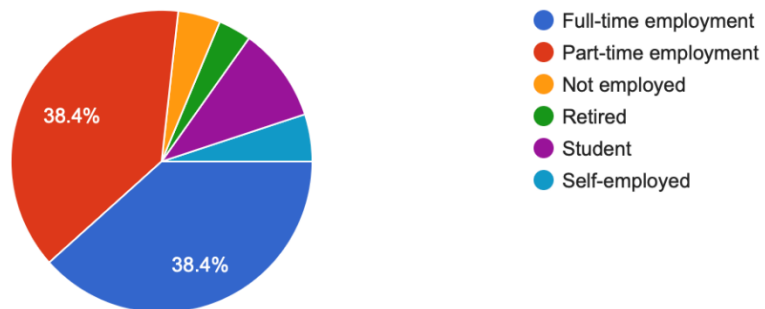
*Figure 3. Participant age*

## Employment status

Full-time and part-time workers comprised the same proportion: 38.4% of participants. In comparison, students were 10.1%, followed by self-employed, not employed and retired, who accounted for 5.1%, 4.5% and 3.5%, respectively, see Figure 4.

What is your employment status?

198 responses



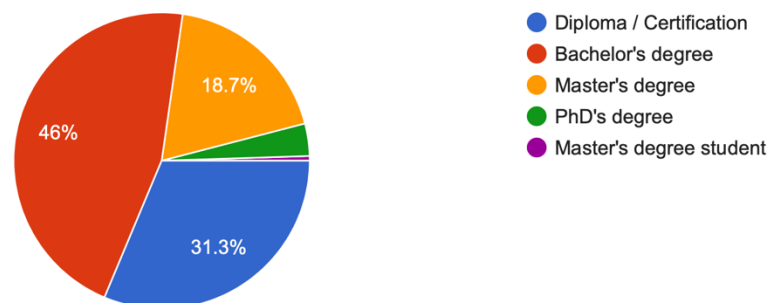
*Figure 4. Participant employment status*

## Education status

The majority were people with bachelor's degrees, 46% of participants. By contrast, one participant was a Master's degree student (0.5%). Master's degree education comprised almost half those who had diploma/certification, 18.7% and 31.3%, respectively. 3.5% of participants had a PhD education, see Figure 5.

What is your education status?

198 responses



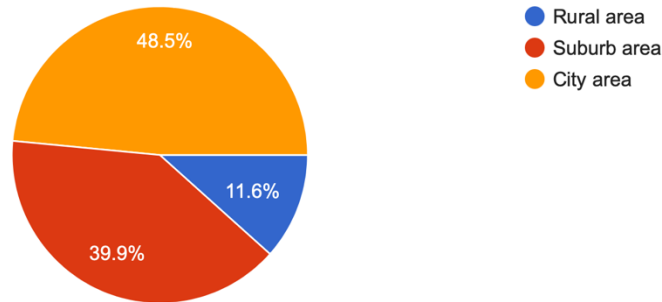
*Figure 5. Participant education status*

## Location of participants

Almost 50% of participants lived in the city area, followed by 39.9% in the suburbs and 11.6% were from rural areas, see Figure 6.

Which area are you living in?

198 responses



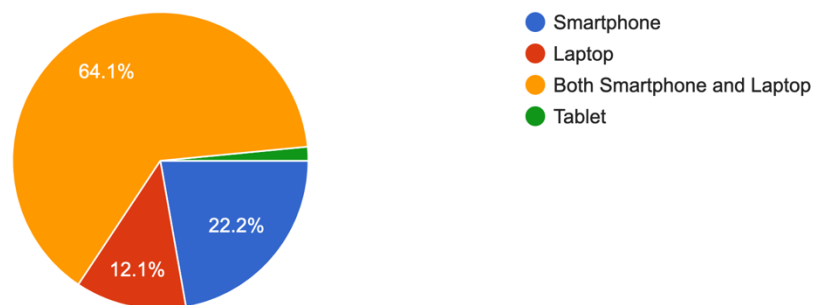
*Figure 6. Participant location*

## The most used device

Most participants use smartphones and laptops (64.1%). Those who use more smartphones than other devices accounted for 22.2% and laptops just a bit more than 10%; tablets were the least with 1.5%, see Figure 7.

What is the most used device?

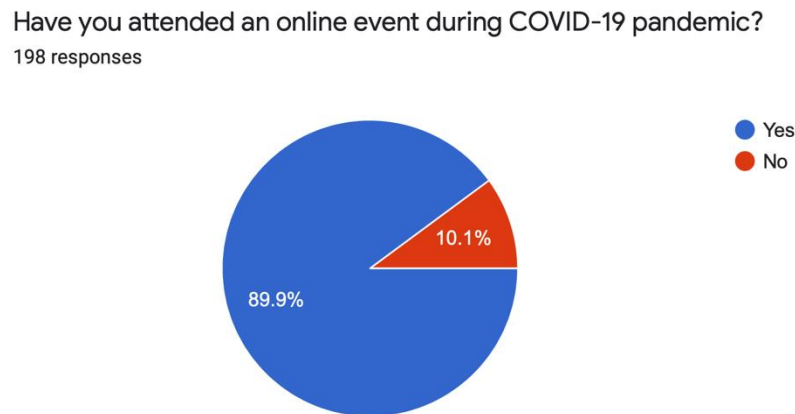
198 responses



*Figure 7. The most used devices among participants*

## Participants who had attended online events or not

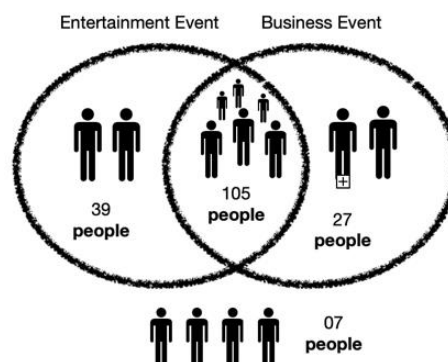
Most participants had attended an online event during the COVID-19 pandemic, accounting for almost 90% of all responses, meaning that 178 participants had attended. In contrast, 20 did not attend, see Figure 8.



*Figure 8. The proportion of participants who have attended online events*

## People attending online events Entertainment vs. Business events

There were 178 who had attended; however, seven people answered that they had not attended either entertainment (Online concerts, online festivals, online shows, online award ceremonies, virtual tours - Museum, Galleries, Zoo, National Park, World-Famous Attractions, etc.) or business events (online conferences & summits, online congresses, online workshops, online trade shows & expositions and webinars & virtual university fairs). That means that 171 participants answered about which type of event they had attended. There were 105 people who had participated in both events, 58.9% of participants, while 39 just attended an entertainment one and 27 people just attended business events, see Figure 9.

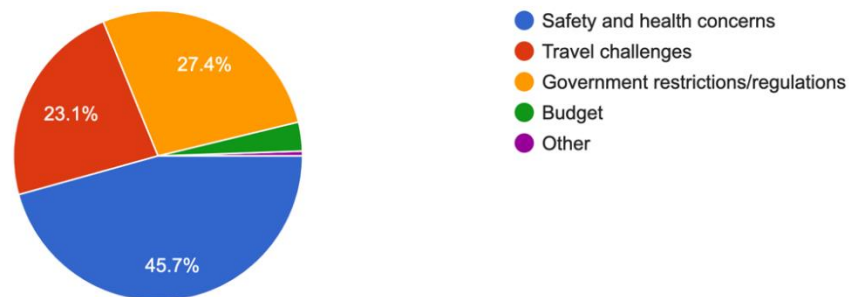


*Figure 9. Entertainment Vs. Business events*

## The factor that most influenced the decision to attend an online event

Most participants answered that safety and health concerns were the most influencing factors in attending an online event, achieving 45.7% of responses. The government restrictions/regulations were the second reason that motivated participants, while travel challenges were the third. Budget was ranked as the fourth factor, see Figure 10.

What factor most influenced your decision to attend online events during pandemic ?  
186 responses

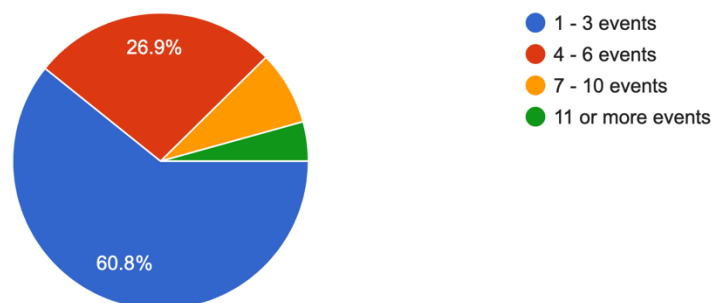


*Figure 10. Influencing factors to attending online events during the COVID-19 pandemic*

## Number of events attended

The number of events attended is relatively low; 60.8% of participants attended 1-3 events, and just 4.3% of participants attended 11 or more events, see Figure 11.

How many online events have you attended during COVID-19?  
186 responses



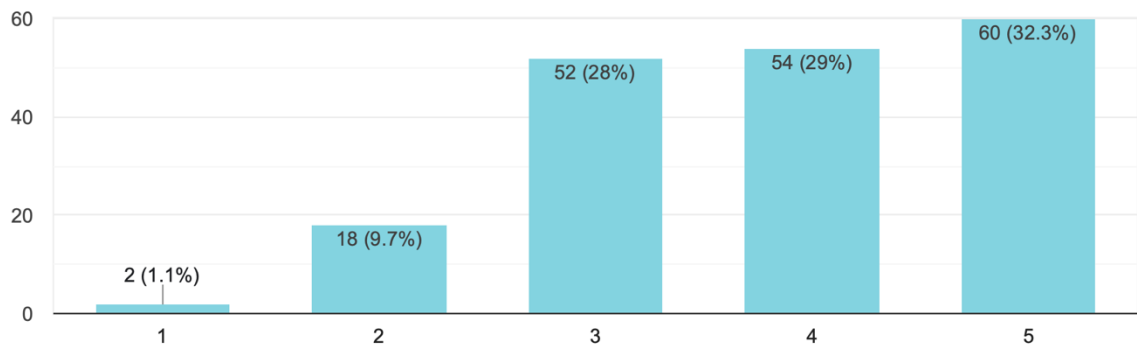
*Figure 11. Number of events attended*

## Satisfaction from the last online event attended

It seems that people were satisfied with the last event attended, with 32.3% of participants finding it was excellent (scale number 5), 29% found it good (scale number 4), and 28% found that the last event was neutral (scale number 3). Also, 1.1% of participants answered that they found it very bad (scale number 1), see Figure 12.

On a scale of 1 to 5, how would you rate the last online event you have attended?

186 responses



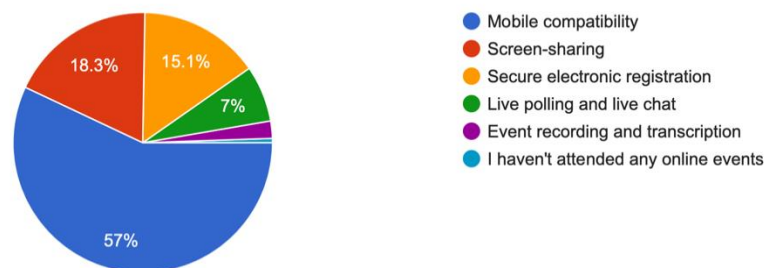
*Figure 12. The scale of the event from the participants' perspectives*

## Favourite features

More than half of the participants (57) answered that mobile compatibility was the favourite feature of online events, followed by screen-sharing, with 18.3% and 15.1% for secure electronic registration, see Figure 13.

Which of the following platform features were your favorite when you attended an online event?

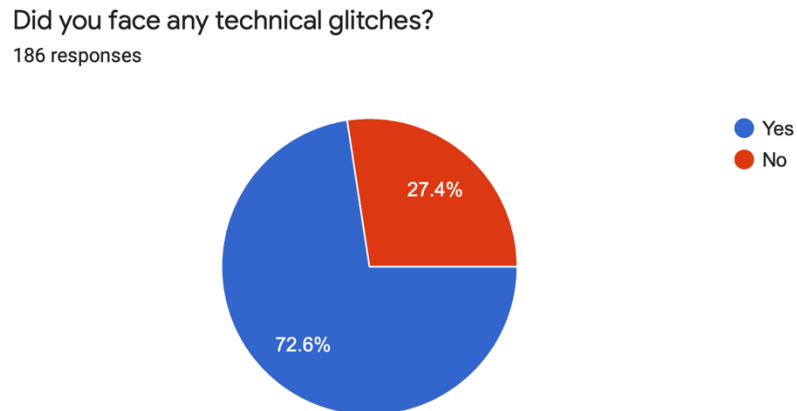
186 responses



*Figure 13. Favourite features*

## Technical glitches while attending an online event

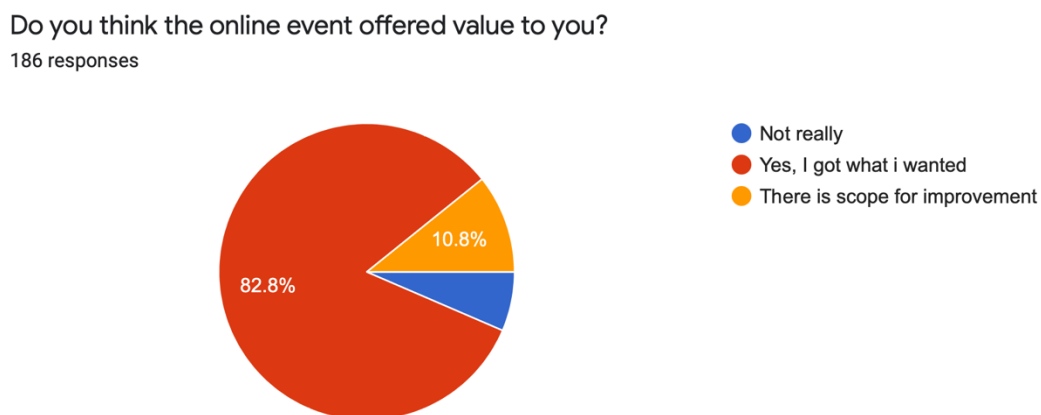
The level of people who faced a technical glitch during an online event was high, accounting for 72.6% of the total participants, see Figure 14.



*Figure 14. The proportion of participants who faced technical glitches*

## The online event offered value to the participants.

82.8% of participants got from the online event what they wanted, while 10.8% of people say there was scope for improvement, see Figure 15.



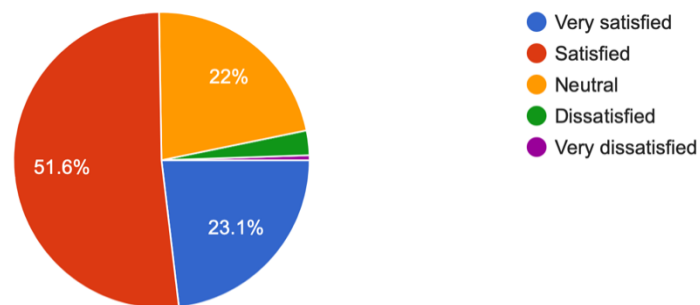
*Figure 15. The online event offered value to the participant*



## How satisfied the participants were in the last online event

Most participants (51.6%) were satisfied with the last event attended. On the other hand, 23.1% were very satisfied and 22% neutral towards the level of satisfaction, see Figure 16.

How satisfied were you with the last online event that you have attended?  
186 responses

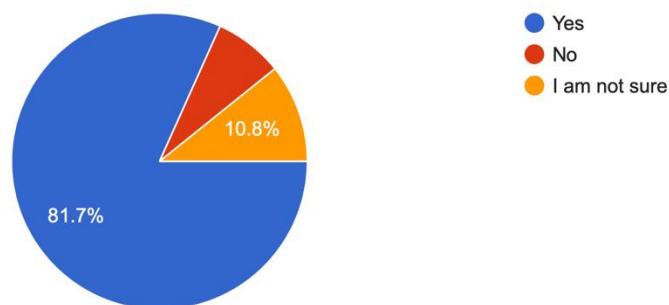


*Figure 16. How satisfied participants felt attending the last online event*

## If expectations were met

81.7% of participants had their expectations met; however, 10.8% of them were not sure about it, see Figure 17.

Did the online event meet your expectations?  
186 responses

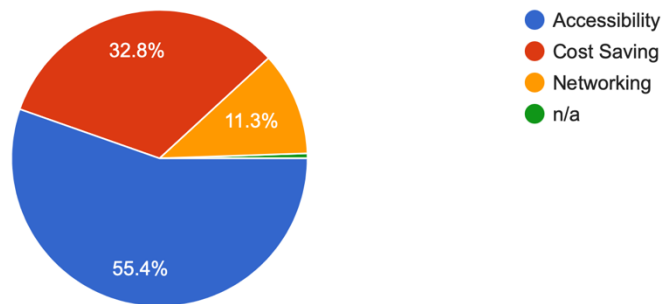


*Figure 17. If expectations were met*

## Benefits of attending an online event

About the benefits of attending the online event, the majority of participants (55.4%) answered that accessibility was the best advantage, cost-saving was second, (32.8%), and networking was the last benefit, with 11.3% of participants, see Figure 18.

What was the best benefit of attending an online event?  
186 responses

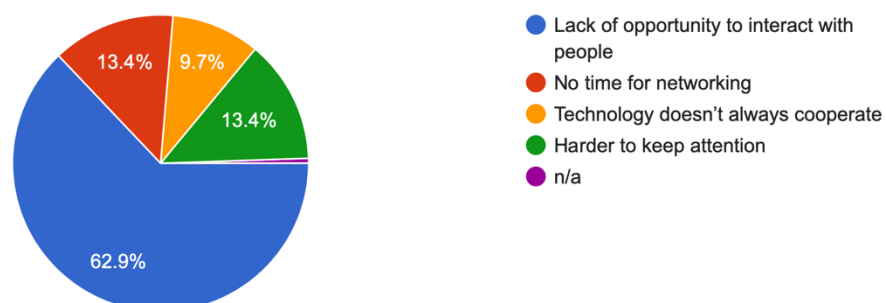


*Figure 18. The most beneficial in attending an online event*

## What participants did not like about attending online events

Regarding the downside of attending online events, 62.9% of participants claimed that lack of opportunity to interact with people was the biggest disadvantage. No time for networking and more challenging to keep attention both have the same percentage of responses, with 13.4% each. On the other hand, technology did not always cooperate and was considered the least pitfall during attending an online event, see Figure 19.

What, if anything, did you dislike about online events?  
186 responses

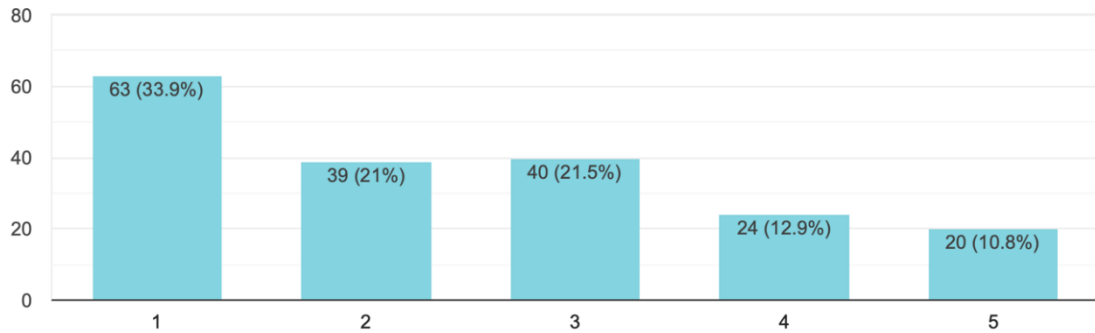


*Figure 192. The biggest disadvantage in attending online events*

## Online events platforms' complexity

There were 33.9% of participants who strongly agreed (scale number 1) that the platform used to deliver online events was not complicated, see Figure 20.

Using an online event's platform was not complicated  
186 responses

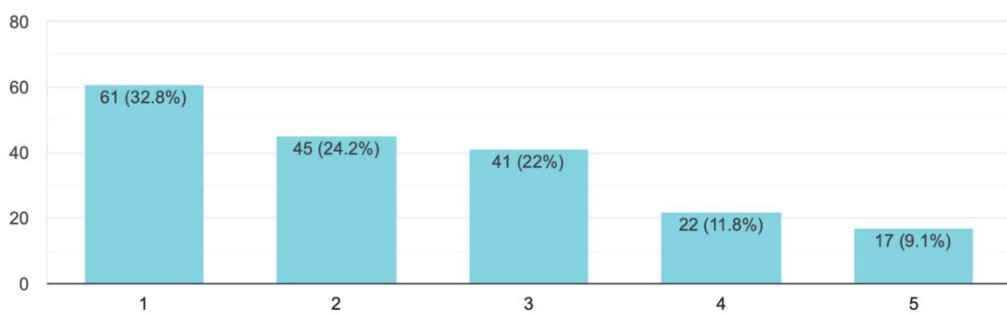


*Figure 20. Level of agreement that online platform was not complicated*

## The content provided was interesting

Regarding the content, most participants strongly agreed that the content was interesting. Just 9.1%, representing 17 individuals, strongly disagreed with this statement, see Figure 21.

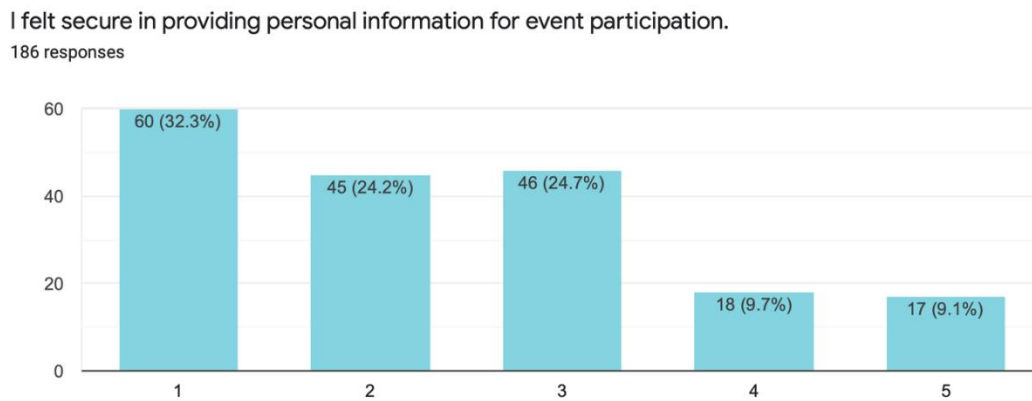
The contents provided by the online event were interesting.  
186 responses



*Figure 21. The content provided on online events*

## The perception of security in sharing personal information

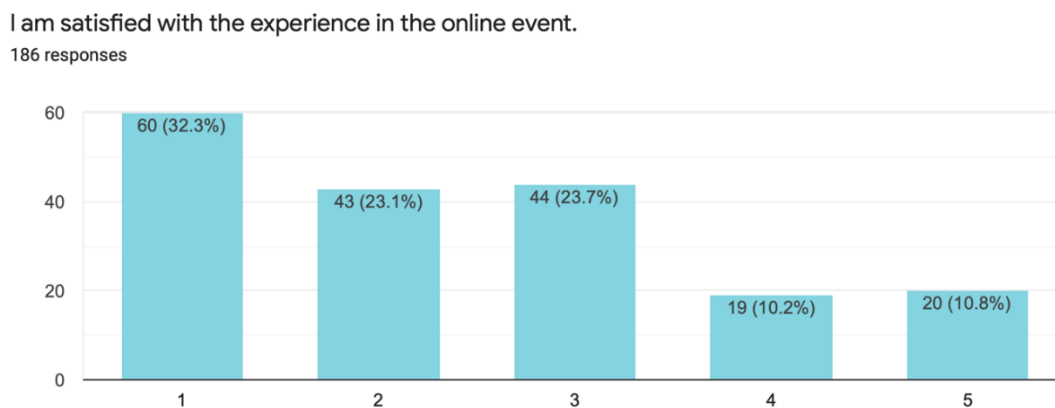
32.2% of people strongly agreed that they felt secure in sharing personal data to attend the online event; however, 46 people, representing 24.7% of participants, were neutral towards this statement, see Figure 22.



*Figure 22. Do people feel secure in sharing personal information for event participation*

## Satisfaction with the experience of attending an online event

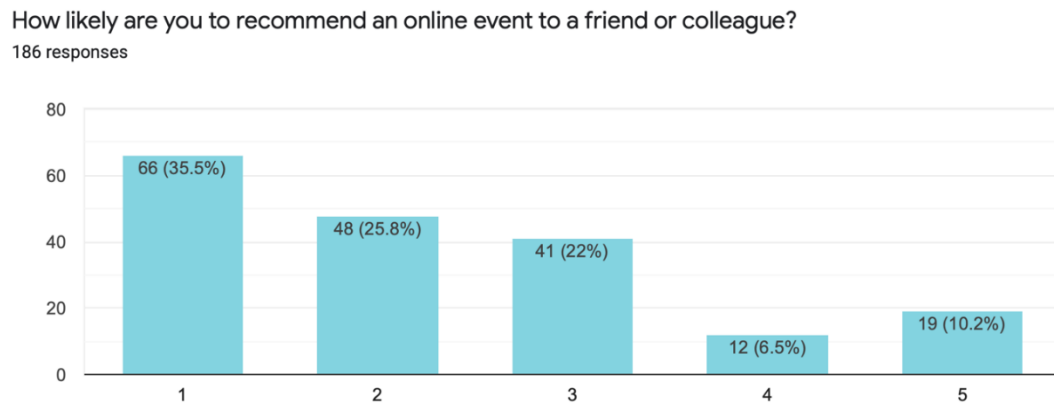
Regarding this statement, 32.3% of participants strongly agreed that they were satisfied, while 23.7% of them answered neutral, see Figure 23.



*Figure 233. Satisfied with the experience of attending online*

### Online events recommended to friends or family

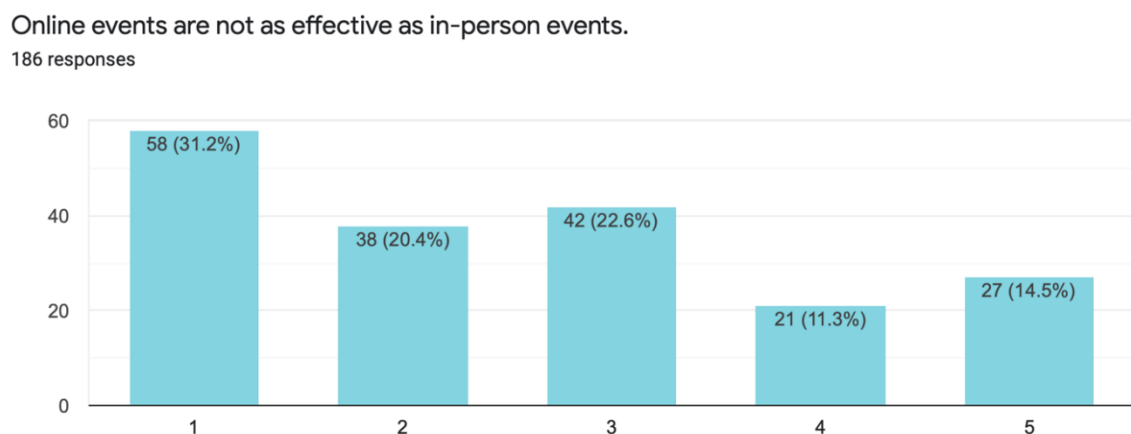
Most participants strongly agreed, with 35.5% of responses, that they were likely to recommend an online event format to a friend or colleague. However, 10.2% of people strongly disagreed, while 22% of participants were neutral towards this statement, see Figure 24.



*Figure 24. Percentage of participants who would recommend online events*

### Online vs in-person events about effectiveness

Even though 14.5% of participants strongly disagreed that online events are not as effective as the in-person format, 31.2% of participants strongly agreed that online events are not as effective as face-to-face events; following these figures, 22.6% of people were neutral, and 20.4% of them agreed with this statement, see Figure 25.

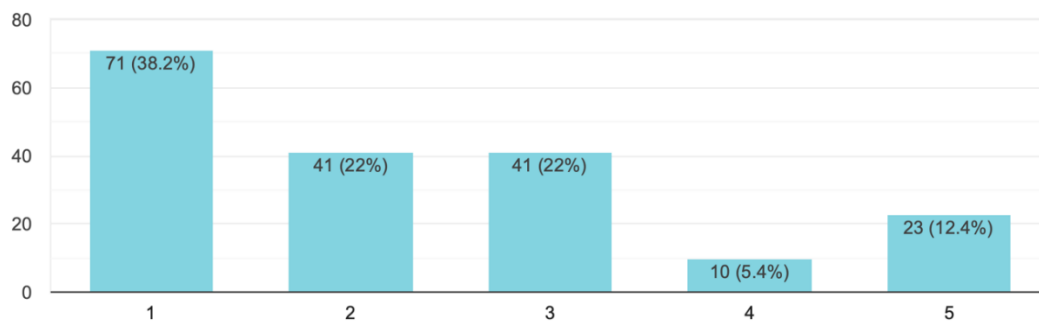


*Figure 25. Online events are as effective as face-to-face events*

## Planning to attend online events again in the future

There were 38.2% of participants who strongly agreed with this statement, while people who were neutral or agreed were the same percentage, with 22% of responses, see Figure 26.

I plan to attend the online event in the future.  
186 responses

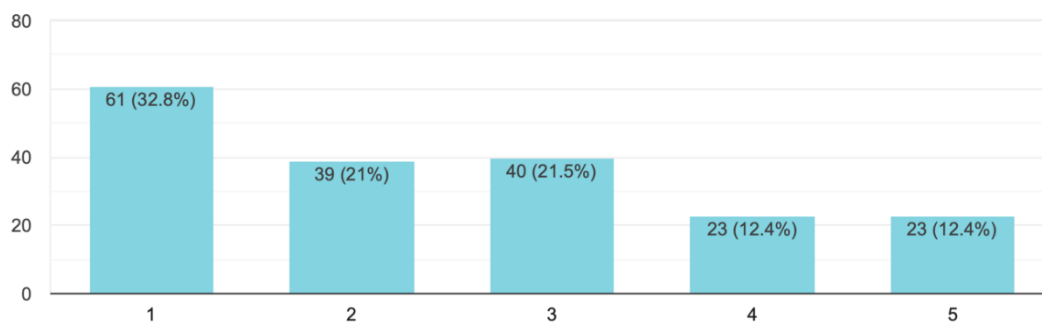


*Figure 26. Planning to attend again an online event*

## Online events will remain after the pandemic covering traditional in-person events

Although 12.4% of participants strongly disagreed and 12.4% disagreed with this statement, most participants who accounted for 32.8%, strongly agreed that online events will remain after the pandemic, see Figure 27.

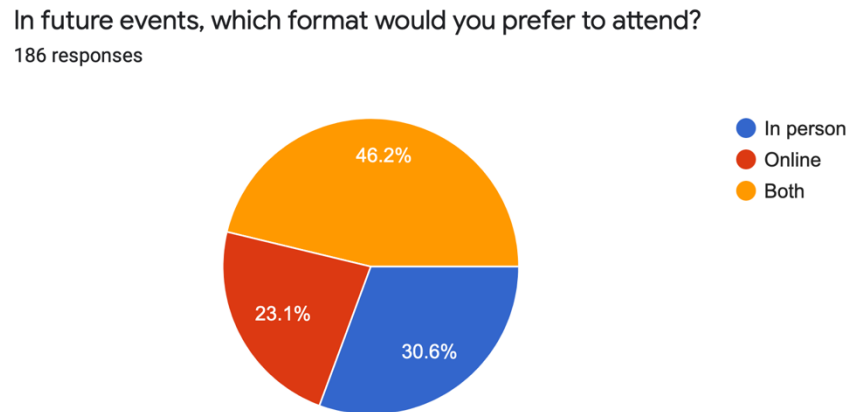
Most of face-to-face events will remain online post-covid pandemic.  
186 responses



*Figure 27. Online events remain after pandemic*

## Which format participants would prefer to attend in the future

Almost half of participants, 46.2%, preferred to attend online and in-person events. In comparison, face-to-face format was the second option, comprising 30.6%, and online is the lowest position, with just more than 20% of responses, see Figure 28.

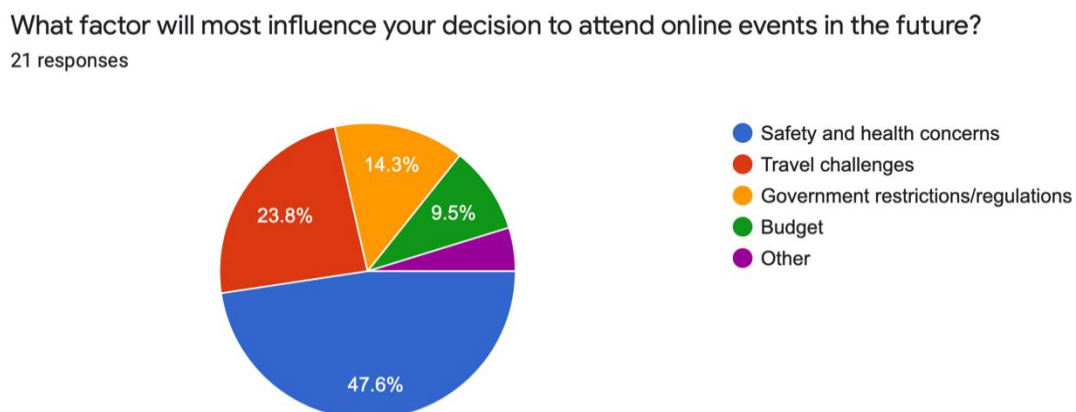


*Figure 28. Attend online or in-person event in the future*

## People who did not attend online events.

### The factor that could have most influence on attending an online event

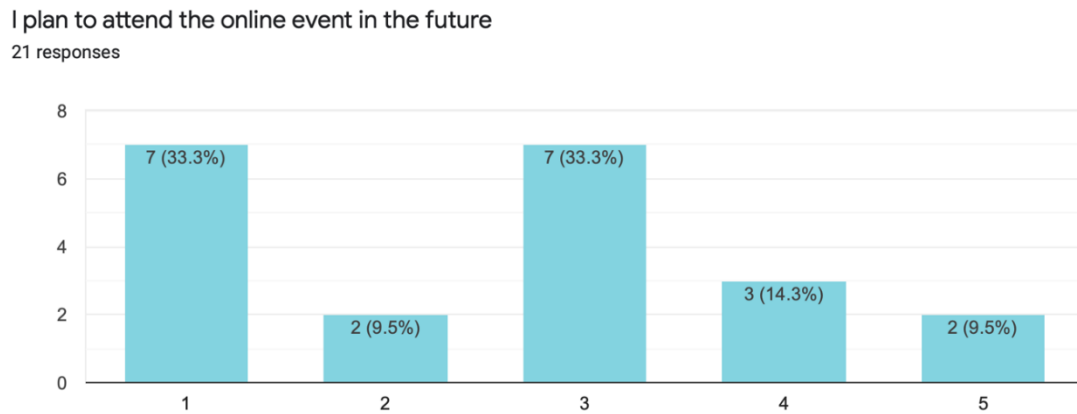
For those who have not attended an online event yet, there was slightly less than 50% who said that safety and health concerns would be the most influencing reason, travel changes were considered the second reason, with 23.8%, government restrictions/regulations ranked as the third potential reason and budget as the last influencing factor, having 9.5% of responses, see Figure 29.



*Figure 29. Influencing factors to attending an online event in the future*

## Planning to attend online events in the future

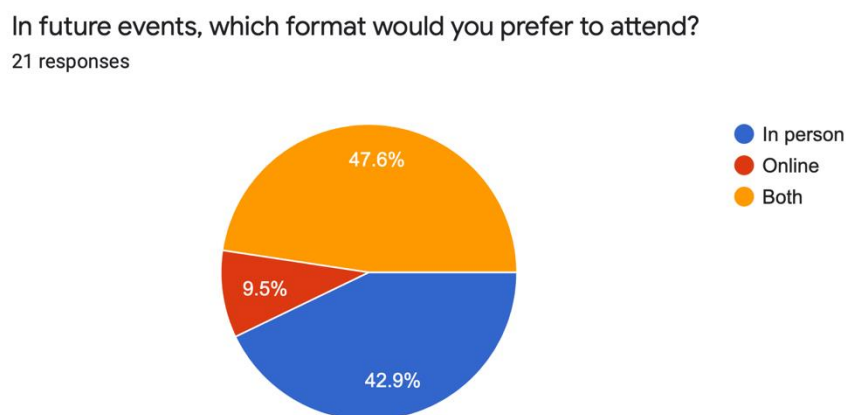
33.3% of participants strongly agreed with the statement that they will plan to attend an online event; however, the same percentage were neutral to this statement, while 14.3% of participants disagreed with it, see Figure 30.



*Figure 30. Planning to attend an online event one day*

## Which format participants would prefer to attend in the future

Just slightly more participants considered attending both platforms (online and in-person), accounting for 47.6% for face-to-face format that made up 42.9% of participants; and 9.5% of people preferred to attend an online event in the future, see Figure 31.



*Figure 31. Attend online or in-person event in the future*



## 5. Discussions

### **Attending online events**

By analysing the responses, 105 people (58.9%) said they have attended not just entertainment events but also those with corporate purposes. It seems that people are satisfied with the last event attended, with 60 of the participants (32.3%) rating as excellent the previous event attended. Most participants, 85 people (45.7%), said that safety and health concerns were the most influencing factor in attending an online event. Most of them had just attended 1-3 events over the pandemic. With 57% of responses representing 106 people, mobility compatibility was the most favourite feature among users, and accessibility was the most benefit in attending an online event. The predominance of participants, 154 people representing 82.8% of participants, thought that online events offered value and, consequently, they got from the online format what they wanted, meaning 152 people (81.7%) had their expectations met. However, lack of opportunity to interact with people made up 62.9% (117 people) as the factor that they most disliked in attending. In the future, most participants would attend both formats, online and in-person, which made up 46.2% (86 people), followed by in-person format which accounted for 30.6% of participants (57 people).

In this study, most participants (178 people = 89.9% of participants) attended online events during the Covid-19 pandemic. Within this group, there was a preponderance of people who have participated in both types of events, for entertainment and corporate purposes, with 58.9% of participants, 105 people. It can be explained that the pandemic forced people and organisations to move online, regardless of their field, profession, or lifestyle. With social restrictions, protocols and lockdowns imposed in New Zealand, individuals had their activities migrated virtually, and organisations such as entertainment companies and event planners, had to change their business model to deliver their service online through resilience in creating new ways of running.

Although 82.8% of participants said that online events offered value and 152 people (81.7%) had their expectations met in attending an online event, it can be noticed that lack of opportunity to interact with people (62.9%/117 people) as the factor that they most disliked in attending this format. In addition, planning events creates more expectations from the attendees about their interactions, requiring planned and designed interactions among participants to make the experience more enjoyable and that will be liked with positive outcomes, satisfaction, and happiness (Litt et al., 2020).

This can justify the figures collected in this study, with a high percentage of online events offering value (82.8% of participants = 154 people), with expectations met according to 81.7 % of participants (152 people), but it is

going down about how they felt about satisfaction (51.6% of participants = 96 people), how strongly they agree to plan to attend an online event in future (38.2% of participants = 71 people), how strongly satisfied they were in the attended online event (32.3% of participants = 60 people) or even if they would recommend an online event to a friend or colleague (35.5% of participants = 66 people), bearing in mind that 117 people (62.9 of participants) said that lack of opportunity to interact with people was what they disliked most in attending an online event.

### **Not Attending an online Event**

In the group who had not attended (20 people = 10.1% of all participants), there was no one less than 25 years old, called emerging adulthood, the phase of life between adolescence and full-fledged adulthood (Hochberg & Konner, 2020), or people between 46 and 55 years. There were 14 people 26-35 years old, four people 36-45 years old, one person 56-65 years old and one person over 66 years old.

That some people had not attended online events during the COVID-19 pandemic can be explained for some reasons, and one of them is that online events are criticised by many due to their “impersonal, faceless, listener attention being diluted by parallel distraction, and prone to technical glitches” (Honavar, 2021, p. 475). Regarding glitches while attending an online event, for those who have attended, this problem happened to most participants (72.6% = 135 people), while just 57 (27.4% of participants) did have to endure any technical problems during an online event.

As also pointed out by Honavar (2021), online events cannot replicate the ability to interact spontaneously and the chance to create a bond with participants. These were some potential reasons for some of the participants not attending. It can result from lack of need to be in an online event once they do not rely on it to maintain their work running or still use the traditional channels to entertain and keep in touch with people, such as TV, radio, telephone, and so. Another reason can be the lack of expertise or ability to interact and complete tasks using computer-based means or even they are reluctant to learn or attend some activity online, being accustomed to traditional formats (face-to-face). Privacy and security can be reasons people do not trust and, consequently, do not attend any virtual event.

In this study, it could be seen that those who have not attended consider the online event as a unique format to participate in an event in the future in comparison to those who have attended, accounting for 9.5%, while those who have attended had 23.1% of responses. There are some underlying reasons for

the group who had not attended online events to be more inclined to participate in person; however, this is out of the scope of this study. But some tips can be seen due to some responses from this group. For example, they were asked about which potential factors could influence them to attend an online event in the future, and the majority of participants considered safety and health concerns as the main potential motivator. That is to say, the findings show that both groups had a closer percentage, 45.7 % (who have attended) and 47.6% (who have not attended), for the similar questions. This can be related to the studies already discussed above, in which the fear of coronavirus is a feeling that still transits through NZ.

## **6. Conclusions and recommendations**

### **Conclusions**

This research attempted to understand the perceptions of event attendees during the COVID-19 pandemic in NZ. The findings revealed a positive and significant relationship between how event visitors felt secure in attending an online event and how likely they would recommend it to a friend and colleague, and how they strongly agreed to plan to attend an online event again in the future. Overall, most participants participated at both corporate and entertainment events; for both purposes, they were considered excellent. Mobility compatibility was the the favourite feature among online attendees, while accessibility was the most beneficial in attending an online event. However, most participants faced technical glitches during an online event, and the lack of possibility of interacting with participants was what they disliked the most in attending online. In addition, the findings also revealed how this negative perception about interaction among participants could drop the positive perception towards future intentions to attend online events or even the level of recommendation of this event on the part of those who did not have significant interaction in the previous online event; apart from influencing how they will assess their own event experience itself. Furthermore, the findings relating to those who had not attended revealed that younger adults had attended more than older ones, and it can be linked to how they feel secure in sharing personal data or are less concerned with infringing of privacy than people above 35 years old.

## **Recommendations**

### **Recommendations for Event Organizers and Event Planners**

To facilitate interaction among online event attendees, it is suggested that designed interactive sessions should be included in the programming of an online event, regardless of the kind of event, either corporate or for entertainment. According to Simons (2018), connecting participants, motivating interaction of attendees and networking can be stimulated and encouraged through the platform used to transmit the event, but also through other technology solutions, such as social media channels like groups on Facebook, and LinkedIn, online communities, and WhatsApp. Strategic marketing and planning for online-event promotion are pivotal to attracting attendees, building interest, and connecting them by facilitating one-to-one conversations in all stages of the event experience. The suggestions above are ways to encourage participants to be in touch before, during and even after the event. It is suggested that connecting practices should be included to boost socialisation between all involved.

Another suggestion to increase the interaction and the attendee engagement is to create more immersive experiences through essential features, for example, real-time polling, quizzes, surveys, chats and live questions and answers (Q&As). Gamification to increase engagement can be an essential strategy. It adds fun and competitive elements to promote a higher level of engagement through assigning points, ranks and badges by attendees' levels.

The study also revealed how people who have attended and those who have not participated in online events are open to attending in the future, both online and in person. Due to the uncertain times resulting from the COVID-19 era, organisers should consider that hybrid events will become increasingly common. It is because mixed events are a kind of event that combines the balance of the two universes, real-world and virtual, giving attendees the freedom to decide which one (online or in-person platform) suits better into their own time, safety and health concerns and travel availability. This means that hybrid events are a new solution to broad opportunities to drive robust engagement across duo environments that will be integrated, providing experiences, interaction and access democratisation for participants offering the best way to meet their needs. For organisers, hybrid events have multiple advantages, such as expanding the audience, since organisers are empowered to reach beyond their typical participants, offer flexible registration options for attendees and reduce event environmental impact, enabling a variety of experiences for participants.

## **Future research**

There are several avenues of potential follow-up research to the present study. First, for this study to not be limited to a closed group, future research should be conducted to reach other communities, analysing and comparing the findings and exploring perceptions from other online event participants across the globe. In addition, in future scholarly endeavours, it is essential to have a more detailed overview of why some people have not attended online events (10.1%), beyond the present study's scope. Another interesting point to be explored is to understand which type of technical glitches (72.6% of participants) are faced in attending online events. Other future research can be oriented to the perception of NZ event participants about hybrid events since it could be seen that both groups, those who have attended (46.2%) and those who have not (47.6%), showed that they are willing to attend both formats, online and in person, showing that there is space for hybrid events in the NZ market.

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# **Digital platforms and technology are helpful in literacy development in ECE. A mono quantitative study in New Zealand**

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## **Abstract**

The main component of this research was to get the insights from teachers on use of digital platforms by teachers in early childhood education to support literacy experiences in Aotearoa New Zealand. This research was conducted to seek experience and views from teachers to note the facts in place. How they are using digital platforms to support the literacy experience for 0-5-year-old learners was the quest for this research. In early childhood education in Aotearoa New Zealand, literacy acquisition is linked to oral language skills where children interact with symbols and functions to understand and retell stories throughout the learning process. Moreover, oral, written, and visual interactions for communication in early childhood education are supported with digital technologies to involve the children.

This was a mono method of quantitative research where survey was used as an instrument for data collection. 122 participants from all over Aotearoa New Zealand participated in this research. From the analysis it is evident that technology has a great potential to support the literacy experience via different websites, and applications from the early years of education. Most teachers do recommend the use of digital platforms to support teaching activities but at the same time children need to be supervised all the time while using or engaging with any digital device. This research explains the teachers' experience and recommendations of digital technologies and platforms based on their usage and reliability to support the teaching activities. The methodology and context of this study is easily adaptable as a reference for any future studies in a similar field.

The findings from this research revealed that in Aotearoa New Zealand, digital technologies have a positive impact to support the literacy experience in early childhood education. SPSS software was used for analysis of data and statistics showed that teachers with training and more experience recommend the use of technologies to support learning in early childhood education. A

literature review was developed to get the idea from previous journal articles and research papers.

**Key Words:** Literacy, Early Childhood Education, Digital Devices, Technology.

## **Introduction**

Literacy in early childhood education is counted as the ability to identify simple letters in alpha scale, and development of English vocabulary by repetitions of poems and rhymes, musical plays, and identification of basic alpha scale letters, especially in name (Poveda, 2019). The literacy in 0–5-year-olds refers to word sounds, recognition of the letters in the alpha scale and numeracy, repetition of simple words to develop a base to learn language. Snow contends literacy as the basic terms like, writing simple alphabets, singing, reading alphabets, and playing with repetition of words from poems and play to develop literacy skills (Snow, 2006). In early childhood education in Aotearoa New Zealand, literacy acquisition is linked to oral language skills where children interact with symbols and functions to understand and retell stories throughout the learning process. Moreover, the oral, written, and visual interactions for communication in early childhood education are supported with digital technologies to involve the children (Ministry of Education, 2021). Digital resources like iPads, iPods, LCDs', digital music instruments, digital displays, sound systems, computers, and laptops are supporting components to make the learning experience more joyful (Kucirkova et al., 2019). Digital platforms comprise tools such as iPods, computers, iPads, laptops, and programmes for communication and progress monitoring that are used to provide instructional materials to learners (Finch & Arrow, 2016). Mobile technology learning is popular in early childhood education through iPads, phones, and tablets. This study found that major barriers for the implication of mobile technology in early childhood education are the lack of equipment, cyber security threats, lack of funding and limited teacher training (Nikolopoulou, 2021). According to Kitalong (2002), technology has a vital role in acquisition of literacy skills in early childhood education. Technologies enable the teachers to adopt significant strategies for learning through play. Computer technology helps learners to develop skills in literacy, numeracy, and basic computer skills in the age range of 0-5 years (Alkhaldeh et al., 2017). Mawson (2011) asserts that technologies have a vital role to make learning more interesting in early childhood education in Aotearoa New Zealand. According to Mawson (2011) the technological curriculum in Aotearoa New Zealand helps to bring knowledge and experience for the users in early childhood education. Digital technologies have a significant impact because teaching strategies boost learning and captivate children through

engaging teaching methods (Zhou et. Al., 2009). In another study, researchers discovered that computer-based games, learning materials, and digital play attract children to participate, teachers can easily organise and track learning in kindergartens with help of technologies. This study also found that learning through digital play and digital games aids in the development of language abilities (Westhuizen & Hannaway, 2021).

The objectives of this research are to look at the usage of digital platforms in early childhood education settings to enhance literacy experiences, as well as to see which platforms early childhood education teachers use and how often they use these supporting digital platforms. This research anticipates understanding the usage frequency of digital platforms to support literacy experiences in early childhood education. A study states that teachers use digital platforms to enhance their teaching with more enjoyable elements such as games and learning exercises. As play is a fundamental and necessary element of children's learning and development in Aotearoa New Zealand, digital platforms play a formative role in their lives. Emerging digital gadgets and games give both enjoyment and education at the same time for mental growth (Gözüm & Kandır, 2021). This research would be useful for future academics and studies to support literature in the same field of research. This research intends to analyse which digital platforms are in use to support literacy in 0–5-year-olds in Aotearoa New Zealand. The research questions are set to know about the digital platforms that especially help to support literacy experiences in Aotearoa New Zealand.

A study revealed that in preschools and kindergartens, integration of strategy and technology supports the literacy experiences. This study also revealed that teachers in early childhood education need training on the use of digital resources as it has a huge impact on the learning experiences (Tran, 2021). This research intends to find out the early childhood education teacher's point of view, like how teachers are finding these platforms to support the literacy experience for better learning. This is also important to know if there are any different apps/devices or digital resources in use to support the learning of early childhood learners. As in Aotearoa New Zealand there is only one curriculum in early childhood education, this research is also set to answer if there are any different apps used when it comes to teaching children from different backgrounds. With Aotearoa New Zealand being vastly multicultural, researchers feel this is also an important aspect to understand after knowing which platforms are in use to support the literacy experiences in early childhood education. The frequency of the usage indicates the more useful platforms in practice. The research questions are answered by reference to primary data.

The research objectives are aligned with the following research questions:

**RQ1.** What are the digital platforms being used to support literacy experience?

**RQ2.** Are teachers finding these platforms useful?

**RQ3.** How often are teachers using digital technology to support the development of literacy skills?

The scope of this research is limited to teachers in the early childhood education sector in Aotearoa New Zealand only. The source of primary data is LinkedIn, WeChat, WhatsApp, Instagram, and Facebook via an online questionnaire on the use of digital platforms by early childhood education teachers to support literacy experiences in Aotearoa New Zealand. The sample size for this study is 120. This sample size was calculated using a non-probability sampling approach. Research background and literature review are supported from peer-reviewed scientific papers.

Some limitations are inescapable in every research and for this research there are three main identified limitations as follows:

The time allotment of 16 weeks for this research means there could be other aspects that may have an impact on the research problem.

Due to COVID-19 and its impact, access to participants was only via online portals, so out of the eligible participants only a small cross section was accessible. Hence, the results may not be a broad picture of digital platforms present, also the frequency of use may not be as accurate.

The scope of this research is confined to Aotearoa New Zealand, so it may not be relevant to any other country.

As a follow up from this study the significance of digital platforms in the wider early childhood sector with ample participants from different types of services could be looked at.

In 0–5-year-olds, literacy refers to word sounds, rearranging the letters in the alphabet, arithmetic, and repetition of basic words to build a foundation for language learning. To build literacy abilities, according to Snow, the most fundamental activities are writing small alphabets, singing, reading alphabets, and playing with repetition of words from poetry (Snow, 2006). Early childhood education is an ideal period to improve literacy skills since early childhood education teachers may easily create and construct play activities that support reading and language development in children aged 0 to 5 (Ministry of Education, 2021). Early literacy skills include the capacity to recognise fundamental alpha scale letters, the formation of English vocabulary through repetition of poems and rhymes, musical plays, and the recognition of

basic alpha scale letters, particularly in name (Poveda, 2019). Literacy refers to the use of sign systems to communicate with one another.

Many in early childhood education today consider 'literacies' to comprise a broader variety of methods that children use to communicate with anyone else, including oral language, movement, mark-making, play, and technology. Children learn to speak in ways that mirror their home learning settings, and literacies differ between cultures. Literacy development starts from birth, long before children learn to read, write, or speak in a formal setting. Emergent literacy is a term used to describe this where teachers, technology and families are playing a significant role in acquisition of language and literacy (Anderson et al., 2019). Houghton (2015) asserts that for early childhood education learners in A, attention is needed in making positive learning relationships for engagement in learning activities. The Te Whāriki curriculum in Aotearoa New Zealand supports a socio-cultural and comprehensive approach to literacy in education. It encourages teachers to think about literacy resource planning, routines to maximize the learning in early childhood education, opportunity, as well as the connections between household, community, and early childhood services (McLachlan et al., 2006). In early childhood education in Aotearoa New Zealand, literacy acquisition is linked to oral language skills where children interact with symbols and functions to understand stories throughout the learning process. Moreover, the oral, written, and visual interactions for communication in early childhood education are supported with digital technologies to involve the children (Ministry of Education, 2021). As Aotearoa New Zealand is a multicultural country the multiliteracy concept is supported with emerging technologies to support multi languages and literacies (Ministry of Education, 2021).

Mawson (2011) asserts that technologies have a vital role to make learning more interesting in early childhood education in Aotearoa New Zealand. According to Mawson (2011) the technological curriculum in Aotearoa New Zealand helps to bring the knowledge and experience for the users in early childhood education. Children in the 21<sup>st</sup>-century are frequently exposed to technology and use it in a sophisticated manner on which Kaiako might expand. Children may engage in diverse literacy activities such as writing, recording, creating their own digital stories even making movies. As children, Kaiako, whanau, and families learn together across cultural, social, and linguistic settings and contexts, these and other literacies bring with them new and varied social practices and cultural interactions. Kaiako may wonder, "Who is the expert here?" as they acknowledge the diversity of cultural information that each child's family offers towards the literacy experience (Ministry of Education, 2021).

According to a Chinese study, information technology and the use of platforms from the start of a children's learning journey have a significant impact on the acquisition of skills and development in all areas of development. The authors of this study discovered that digital technologies have a significant impact because teaching strategies boost learning and captivate children through engaging teaching methods (Zhou, et al., 2009). According to Kitalong (2002), technology has a vital role in acquisition of literacy skills in early childhood education. Technologies enable the teachers to adopt significant strategies for learning through play. Active use of technology for teaching has been promoted in Aotearoa New Zealand since the early years of education to build educational knowledge. The early childhood digital curriculum is meant to examine language skills, culture, basic mathematics, and games in which teachers may nurture learners by teaching and developing their cognitive capacity and communication abilities (Ministry of Education, 2021). It is knowledge of technical literacies in the 21st century, along with a current understanding of usage in the context of early childhood education, that supports pedagogical practices. Digital technologies and platforms are becoming increasingly important, and they must be included in early learning programmes to enable successful teaching and learning. This study also found that early childhood centres in Aotearoa New Zealand require additional digital tools to enhance activities and learner experiences (Benade et al., 2013). In preschools and kindergartens, integration of strategy and technology supports literacy experiences. This study also revealed that teachers in early childhood education need training in the use of digital resources as it has a huge impact on the learning experiences (Tran, 2021). According to the findings of Tootell et al. 2014, games and technology have their own place in the early childhood education business, where they assist teachers in encouraging children to participate in learning activities and have a good influence on the learning experience. In Aotearoa New Zealand, technological tools in early childhood education are used to promote writing, reading, basic arithmetic, and communication skills. Te Whāriki, the early childhood education Aotearoa New Zealand curriculum, recognises technology as a key component in achieving literacy goals in early childhood education (Tootell et al., 2014).

According to the findings of a study carried out by Gorshenin in 2018, teachers in early childhood education are quickly adopting information technology because it enables more convenient ways to provide and organise study materials (Gorshenin, 2018). The digitalisation of education for children aged 0 to 5 years old makes learning and developing abilities more pleasurable. Previous research has found that music-based pedagogies include children in the development of their communication abilities. Children are motivated to get involved by various sounds; in this case, information technology and

digital devices are the primary means of involving learners for educational and recreational purposes (Gözüm & Kandır, 2021). Another research found that improved educational culture requires digital platforms in the form of ICT. Teachers' perspectives on how technology and digitalisation make learning and teaching more spectacular, fascinating, and vibrant were also shared by the author. Laptops, projectors, screens, smart phones, PowerPoint presentations, photographs, and sound systems were among the digital platforms utilized during the lecture, according to the author. The author stated that digitalisation might play a critical role in making learning more engaging and fascinating for early childhood education students based on the findings of this study (Rahiem, 2021). Teachers demonstrate this proactive use of ICT in the sample "Infant daily programme sheets," in which teachers in an early childhood education centre use a digital camera and a computer to make annotated drawings of the day's learning activities. The objective of these is to allow families and Whānau to participate in the day's events, as well as allowing children to revisit the activities with their families at the finish of the day (Ministry of Education, 2020). Moreover, iPads, iPods, LCDs, digital music instruments, digital displays, sound systems, computers, and laptops are examples of digital resources that may be used to enhance learning (Kucirkova et al., 2019).

A culturally responsive curriculum in early childhood education with integration of digital technologies fills the gap in learning of multiliteracies in pre-schools. This study stated that digital technologies are supporting literacy experiences in early childhood education (Kim et al., 2021). In another study the researcher found that computer-based games, learning material and digital play attract learners and it is easy for teachers to organise and track the learning in kindergartens. This study also provided information that learning through digital play and digital games is helpful in language skills development (Westhuizen & Hannaway, 2021). Teachers are using digital platforms to enhance their teaching with more enjoyable elements such as games and learning exercises. As play is a fundamental and necessary element of children's learning and development in Aotearoa New Zealand, digital platforms play a formative role in their lives. Emerging digital gadgets and games give both enjoyment and education at the same time for mental growth (Gözüm & Kandır, 2021). A technological environment helps to engage children in learning activities by facilitating them with different features to play and learn at the same time (Fox-Turnbull, 2019).

Computer technology helps learners to develop skills in literacy, numeracy, and basic computer skills in the age range of 0-5 years (Alkhaldeh et al., 2017). Computer-based games, learning material and digital play attract the learners and it is easy for the teachers to organise and track the learning in

kindergartens. This study also provided information that learning through digital play and digital games is helpful in language skills development (Westhuizen & Hannaway, 2021). The author stated that computer technology and teaching practices should be aligned for the best learning experience. There is a significant difference in teaching practices after obtaining training for technological use of computers in kindergartens (Ihmeideh, 2009).

The iPad is a useful tool to motivate children towards literacy learning activities, as it facilitates the users with diverse functions where children can play learning-based games, record and play audio and video, and painting which attracts children to get into game and play-based learning practices in early childhood education (Hatherly & Chapman, 2013). A study from Aotearoa New Zealand revealed that the iPad revolution in early childhood education encourages the engagement in learning activities. Apart from teachers' daily routine context and practices, the iPad is helpful to track learning activities and development progress from the different websites or apps that are in use to deliver learning material (Khoo et al., 2015).

By revisiting children's learning and explaining through recordings in digital cameras what was happening at the time, children develop verbal literacy skills and in some cases in written as well. According to Howe (2016) for documentation and reflection of learning experience in early childhood, digital cameras have a vital role to record and review the progress during the learning activities. Teachers use photos and videos of children for a variety of reasons, including creating a noticeboard exhibit of classroom progress of the project, creating innovative learning resources, representing children's development and growth as part of a student's portfolio at parent meetings, opening a window into the classroom via slideshows or bulletins, and illustrating presentations at professional meetings within the early childhood centre (Howe, 2016).

Mobile technology learning is popular in early childhood education through iPads, phones, and tablets. This study found that major barriers to the introduction of mobile technology in early childhood education are the lack of equipment, cyber security threats, lack of funding and limited teacher training (Nikolopoulou, 2021). In infants and toddlers, the use of smartphones in education and at home with parents is increasing with their interest in playing games for entertainment as well as for learning purposes. The revolution of smart phones brought a big change with technological advancement by providing live games for learning through play, and internet-based apps and websites to develop skills. At the same time, it has some adverse effects like excessive use of smart phones that lead to poor health and addiction for users (Baek et al., 2013).



Storytelling activities with word repetitions and with musical plays help the children to get involved in learning activities. Digital platforms are helping to deliver content in an interesting manner with sounds, musical background, and character movement (Kucirkova et al., 2019). Storytelling in kindergartens helps the teachers to make learning interesting and helps children to enhance writing skills along with the oral language skills which supports the literacy development in early childhood education context in a playful manner (Maureen, 2021).

The user experience of learning and teaching has altered because of the digital revolution in the education industry. Now, learning activities that take place throughout the day are integrated into games to enhance overall development through digital play (Plumb & Kautz, 2015). Another study found that over the traditional methods of learning, the technologies make the learning more joyful with digital play. As digitally supported puzzles, and games make learning and teaching easy to learn and assess for the feedback where after play results can be stored and shared for feedback on the learning progress (Stephen & Edwards, 2017).

Storytelling activities with word repetition and with musical plays, help the children to get involved in learning activities and digital platforms are helping to deliver content in an interesting manner with sounds, musical background, and characters' movement which enhances the interest of children to involve in learning (Kucirkova et al., 2019). In Aotearoa New Zealand it is evident that technology helps to enhance the interest in learning in early childhood education. Technologies support the learning environment by providing knowledge through collaborative play for the development of the learners in early childhood education (Mawson, 2011).

Children's use of ICT can create an environment for cooperation, collaboration, and enjoyable learning experiences. This, however, will not occur on its own. According to research, practitioners must be aware of what kind of learning exchanges they'd need to see happen in the context of ICT use (including between children, or between children and adults), and to use educational tools to help them succeed. In this manner ICT is utilised to help many elements of learning, such as language and literacy development and learning mathematical thinking, as well as mental growth (Bolstad, 2004). The author began the study by examining the effects of technology on early childhood education. On the plus side, technology makes teaching and learning more engaging, entertaining, and motivating by using various pictures, sounds, and themes. On the other side, using digital platforms may cause behavioural changes in children, such as an increased risk of gaming addiction, which can lead to ill health (Peas, 2019; Blatchford &

Blatchford, 2006).

Some academics believe that computer/ICT use is inappropriate for the cognitive, physical, emotional, and social development of children. However, there is no solid evidence to back up this claim, and it is progressively being replaced with the belief that ICT may be a beneficial tool for aiding the learning and development of children when properly utilized. Many authors emphasized the need of practitioners being aware of health and safety risks. Concerns about children's usage of ICT should be addressed at an early childhood education centre. Policies and practices should be in place in the field of information and communication technology in early childhood education centres. This involves paying attention to the physical and psychological safety of children (Bolstad, 2004).

### **Methods**

Descriptive research entails gathering data in the respondent's natural setting, resulting in high-quality and truthful data. Data collection was simple and affordable since a descriptive study employs a large sample size. This research project was carried out with a descriptive approach with utilization of specialized technique: survey. The primary data collection techniques were included, resulting in a massive volume of data. This knowledge can be applied to future research or even to developing a hypothesis for the research problem. Because the information gathered was based on both qualitative and quantitative data, it gives a full grasp of the research topic.

This descriptive research approach is used for this cross-sectional study that examined several elements of a specific population. The population for this research was teachers in early childhood education and this research was set to analyse the use of digital platforms in early childhood education to support the literacy experience in Aotearoa New Zealand.

For this research the mono quantitative approach is used with a positivist paradigm research philosophy.

This research was conducted based on a deductive approach where data was collected by using the mono quantitative method, using an online questionnaire as an instrument divided in two sections:

- Section A was designed with closed-ended questions and
- Section B was designed with open-ended questions.

The data collection approach for this study was a survey using a questionnaire. The questionnaire had 21 open-ended and closed-ended questions that related

to the study questions.

Time horizon for this research was cross-sectional as this was a one-time study focusing on finding the usage of digital platforms in early childhood education to support the literacy experiences.

The quantitative approach was the method of choice for this research. A questionnaire, divided into two sections, was used to collect information. Closed-ended choice-based questions make up Section A, whereas open-ended explanation-based questions make up Section B.

Quantitative research has some weaknesses like no human views or beliefs, insufficient resources for a large-scale study, and no in-depth description of the experience.

The quantitative approach was considered as due to the present circumstances of COVID-19 it was not possible to visit the centres in person for data collection. So, the data for this research was gathered using an online survey. As a research tool, a questionnaire was employed. Before and after compiling the questionnaire, the questions were addressed to the supervisor and all necessary changes were made before data collection to ensure that it was a practical instrument for data collection.

For this study, the sampling frame was early childhood education teachers in Aotearoa New Zealand. The purposive sampling method, which is part of the non-probability sampling approach, was used in this research. Participants were selected for this sampling strategy based on their availability and willingness to participate. The participants were given a link to the questionnaire via social media networks. This research has a sample size of 120 people. For this research, early childhood education teachers in Aotearoa New Zealand were the required participants. Social media platforms like WhatsApp, Facebook, email, Instagram, WeChat, and LinkedIn were used to reach out to research participants. As social media is widely in use and there are special groups available for the early childhood education field. A poster was also designed to distribute through social media with a link to a questionnaire to get the attention of potential targeted participants. Time to time reminders were sent on social media to fill in the questionnaire.

After data was collected data analysis, explanation and interpretation was performed by using the tools for quantitative analysis, SPSS and Pearson correlations, and content analysis analysed the responses of the open-ended questions. Moreover, the Pearson tool was used within SPSS to gather a robust statistical outline. For data analysis, after the selection of tools and software for analysis, the second step was to get to know that software. In the third step,

data was transferred to the software after coding based on the deductive approach, and data was visualised to interpret the findings. The findings from this study are applicable in Aotearoa New Zealand only.

ICL Ethics policy and guidelines were followed in the data collection process for this study. Ethics application Form A with reference number ICL 251121-122 was submitted for ethical consideration and has been approved by the ICL Ethics Committee. Participation to respond to the questionnaire was based on consent of the participant and all responses were anonymously noted from P-1 to P-120 for data analysis purposes. An approved participant information sheet (PIS) and participant consent form (CF) was attached to the questionnaire where participants were given a choice to withdraw consent and could ask for the results of this study. This study was conducted under the supervision of an instructor from ICL Graduate Business School by following the policy and guidelines of the ICL Research and Ethics Committee.

The data collection and access for this mono method quantitative study was performed by using survey monkey online software with a well-designed questionnaire. The material for literature from current websites and journal papers was utilised to establish a foundation and in-depth evaluation of the research through internet access. The research techniques resulted in no charges. In Aotearoa New Zealand, a link was given for data gathering using internet platforms such as Facebook, WeChat, Instagram, email, and WhatsApp. The use of free online software and applications was considered to analyse data. The researcher already had access to the library and a laptop.

## **Findings**

From the findings it is evident that 103 research participants agreed that digital platforms are beneficial to support the literacy skills of children. In contrast to this, 19 research participants out of 122 replied with negative responses to this question. The survey has revealed that digital platforms are effective or beneficial to support the literacy skills of children. Moreover, it is appropriate advice for parents and teachers to focus on the use of digital platforms for the purpose of achieving improvement in Children's literacy skills. In addition to this, it can be said that use of applications or digital platforms can help to achieve the goal of higher academic performance of children. One of the benefits of digital platforms for learners is that they are effective to support the learning of children or learners through use of audio-visual presentations of key content or sessions. This kind of presentation and learning sessions have a greater influence on the learning ability of learners.

From this study, it was found that different research participants have different opinions regarding the effectiveness of digital platforms to support the literacy

experience of learners of the age group 0-5 years. For example, 23 research participants showed strong agreement towards the effectiveness of digital platforms. While 72 participants showed agreement, 13 participants were neutral, and 14 participants replied with negative responses. Based on these findings, it is revealed that 77.87% of the research participants agreed that digital platforms are effective for supporting the literacy experience of learners of 0-5 years of age. While only 11.48% of research participants disagreed. In this context, it can be said that digital platforms are beneficial to support the literacy experience of learners of 0-5 years of age group. Based on these findings, it is observed that parents and teachers are recommended to focus on the use of digital platforms with the aim of enhancing the literacy experience of their children because digital platforms have potential to enhance academic performance and learning ability of the children.

Analysis identified that 84.43% of participants agreed that they have proper access to different digital resources for supporting their teaching activities. On the other hand, 15.57% of participants indicated they do not have access. In this finding, it can be argued that most research participants have proper access to digital resources for ensuring effectiveness of their teaching activities. Furthermore, it can also be depicted that modern organizations and individuals have focused on the use of digital resources as part of their teaching activities. This type of trend indicates the increasing awareness and use of digital resources in the teaching sector with the aim of achieving an optimal level of learning of the learners of 0-5 years of age.

Moreover, it was identified that all 122 of the research participants agreed that they would recommend the use of digital resources for supporting the literacy experience of learners. It can be said that all research participants believe that application or use of digital technologies can enhance or improve the literacy experience of learners.

It is observed there are different types of digital applications that are used by different people as part of the teaching and learning environment. Examples of these digital apps involve utility applications for supporting numeracy and literacy skills, entertainment apps, gaming apps and other apps. Forty-four participants have indicated that they use utility apps as part of their teaching activities. At the same time, 32 participants have indicated that they use entertainment apps for supporting the learning of the children through improved teaching activities. In contrast to this, 12 participants stated that they are using gaming applications like puzzles, and charades for enhancing the learning and literacy experience of children. Thirty-three participants use other apps. From these findings, it can be said that utility apps are used by the highest number of research participants. At the same time, game apps are used

by the lowest number of participants.

Furthermore, it is found that 32 participants out of 122 use digital resources like apps and websites on an everyday basis as part of their teaching activities. At the same time, 56 participants indicated that they use these resources a few times a week. Thirteen participants indicated that digital resources are used by them about once a week. Nine participants use apps and websites a few times a month. Some of the research participants (i.e., 4 out of 122) use apps and websites once a month. At the same time, seven participants indicated that they use digital resources like apps and websites less than once a month. Based on the analysis, it was revealed by the survey that frequency of use of digital platforms like apps and websites is high among most participants.

From analysis it is evident that 45.08% of participants believe that more changes in terms of use of technology in the past few years have been seen. Similarly, 40.16% (i.e., 49 participants) believe that many changes in the use of technology have been experienced in the past few years. 1.64% of participants believe that fewer changes in the use of technology have been observed, whereas 8.20% think that the use of technology is at the same level and has not changed. At the same time, 4.92% of participants believe that less change in the use of technology has been observed. Overall, it can be said that a significant level of change has been observed in the use of technology. This is so because different types of advancements have been seen in digital technologies that have caused the change in use of technology.

#### 4.2.21: Correlation of Opinions of Respondents (who have not done training) regarding Effectiveness of Technology for Literacy

Frequency Table for Respondents in Context of Training Done:

**Table 1: Training Done**

Statistics			
Training Done			
N	Valid	122	
	Missing	0	

Training Done					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	43	35.2	35.2	35.2
	2.00	79	64.8	64.8	100.0
Total		122	100.0	100.0	

Frequency Table for Effectiveness of Technology for Literacy:

**Table 2: Effectiveness of Technology to Support Literacy**

Statistics			
Effectiveness Support			
N	Valid	122	
	Missing	0	

Effectiveness Support					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	103	84.4	84.4	84.4
	2.00	19	15.6	15.6	100.0
Total		122	100.0	100.0	

Correlation Table between Training Done and Effectiveness of Technology to Support Literacy

**Table 3: Correlation between Training Done and Effectiveness of Technology to Support Literacy**

		Training Done	Effectiveness Support
Training Done	Pearson Correlation	1	.317**
	Sig. (2-tailed)		.000
	N	122	122
Effectiveness Support	Pearson Correlation	.317**	1
	Sig. (2-tailed)	.000	
	N	122	122

\*\* . Correlation is significant at the 0.01 level (2-tailed).

From Tables 1, 2 and 3, it is observed that 43 research participants out of 122 had received training for the use of digital technologies and devices. At the same time, 79 research participants had not received such training support. From this, it is evident that 103 research participants agreed that digital platforms are beneficial to support the literacy skills of children. In contrast to this, 19 research participants out of 122 replied with negative responses to this question. Furthermore, it is observed that the participants, who had not received training in technology, also believe that technology is effective to support literacy skills of learners. This is so because technology training was received by only 43 research participants, but 103 research participants believe that technology is effective to support the literacy skills of children.

However, there is no significant correlation between training done and the views of respondents towards effectiveness of technology for literacy. In support of this, the correlation table shows the value of the correlation coefficient as 0.317. This value of correlation is very low, indicating a very low correlation between training done and the response of research participants towards effectiveness of technology for literacy. In addition to this, the low correlation is also showing positive views of respondents towards the effectiveness of technology for supporting literacy skills of children.



## **Conclusion**

This research project aimed to investigate the use of digital platforms by early childhood education teachers for supporting the literacy experience in Aotearoa New Zealand. This research was intended to identify different digital platforms that are used by early childhood education teachers for supporting the literacy experience of children. One of the aims of this research was to identify the opinions of teachers regarding the usefulness of digital platforms for supporting the development of literacy experience and literacy skills of children. In general, literacy skills may be defined as the skills or abilities of individuals that enable them to read and write. In addition to this, the literacy skills also stand for the skills and competencies related to reading and writing of the alphabet, singing, playing with repetition of words from a poem, recognizing words and characters, numeracy skills etc.

From the findings of previous literature and the survey, it can be concluded that the use of digital platforms supports literacy. The digital platforms are used by teaching staff from time to time to support the development of literacy skills of children. For example, the teaching staff focus on use of digital learning materials, audio-visual learning materials, recording learning sessions and projectors for contributing positively towards the improvement of literacy skills of learners in the 0-6 years age group. Moreover, animated learning tutorials are developed and shown to learners to support their literacy experience.

From this study, it can be concluded that early childhood is an ideal period for the development of literacy skills. The development of literacy skills is easier at this stage of life (i.e., 0-6 years of age) as compared to developing literacy skills among older adults. The literacy skills are also developed among children for improving their ability to identify basic numbers, development of music playing skills, development of English vocabulary, repetition of rhymes and poems and identification of basic alpha scale letters. These findings are like the study from Westhuizen and Hannaway (2021) and Hatherly and Chapman (2013). Moreover, literacy consists of a broader variety of methods by which children communicate meaning or message like movement, oral language, technology, play, and mark making. It is also a major finding of the research that literacy development starts among children from their home. There is significant influence of the home environment settings, culture and technology on the learning and literacy skills of children.

From this survey, it is observed that there are different types of components and devices that may be considered to support the literacy experience in ECE. Examples of these components and devices include laptops, iPads and books that should be used as technology in ECE. The application of these

technologies and resources can help to meet the goal of learning needs of learners in an effective manner. In addition, key devices like tablets, iPads and TV are also important types of technologies in ECE that have potential to improve learning and skills of early age learners. These types of digital technologies use multimedia features for contributing positively towards the learning needs of the children. The findings are also like the results of Zhou et al., (2009) and Kitalong's (2002) studies that technology is supporting the learning experience in ECE. The educational mobile applications are also considered helpful to support literacy experience in ECE. This is so because the educational applications are developed in accordance with the learning needs of the intended audience or users. Apart from this, the use of interactive boards, robots and monitors are also examples of different technologies being used to support learning in ECE. However, the teachers or tutors should have proper knowledge of these technologies to use them in an optimal manner for the improvement of literacy skills of children.

Emergent literacy is also an important type of concept in the field of literacy development. The concept or terminology of emergent literacy is used for describing the significant role of teachers, technology, and families in accumulation of language and literacy among children. In this regard, it can be said that technology plays an important role in the development of literacy skills among children. The Te Whāriki curriculum also supports the socio-cultural and comprehensive approach towards literacy in education. This approach motivates the teaching staff to think about the position of literacy in the physical environment. It is an important finding of the research that written, oral and visual interactions of communication in early childhood education are supported through digital technologies.

Similarly, the multi-literacy concept is also supported by digital technologies for the purpose of supporting the development of multiple languages and literacy. It is a fact that children of the 21<sup>st</sup> century are surrounded by technology and its sophisticated ways of use in life. Here, the role of technology may not be avoided in the development of literacy skills among the learners of the 0-6 age group. Parents are also found involved in practices of giving smartphones to their children with the aim of improving their literacy skills in the form of the ability to recognize animals, fruit, and vegetables through audio-visual aids. Technologies like smart phones, education applications, games and tutorial videos are observed as being quite effective to support literacy development among children. In modern times, children are engaged in a wide variety of literacy activities such as recording, writing, and creating their own digital stories.

As per the analysis of findings of the survey, it is identified that YouTube, Educa, Coco melon, Story Park and Google are some important types of applications and websites that are used by research participants for enhancing literacy experience of the 0-6-year-old learners. Apart from this, music apps and drawing apps are effective apps that are used by them to improve the literacy experience of learners. It is also an important finding of the analysis of the survey that Facebook and other social media platforms are also important apps or websites that contribute positively towards the learning of the 0-6-year-old learner. Story telling applications contribute positively towards learning of 0-6-year-old learners. Mobile applications like Spotify have the potential to enhance skills related to music, dance, yoga support and singing of learners. These findings are like the findings of studies from Kucirkova et al. (2019) and Maureen (2021) proving that digital support via applications and storytelling modes make the learning experience more improved and joyful.

The users of digital devices can use the feature of sharing devices while singing and playing. It is also a positive attribute of the technology that such technologies are attractive for early age learners, encouraging them to learn new things with positive energy. The visual aid feature of digital technologies creates a positive impact on the learning ability of early age learners. From this research, it is observed that information technology and digital platforms have significant contributions in supporting the literacy experience of children in the 0-6-year age group. Moreover, digital technologies have significant influence on teaching strategies to boost learning among early age learners. These findings are also the same as studies from Major et al. (2018) and Pacheco et al. (2018) proving that technologies have a positive impact on the learning environment and contribute to supporting the literacy experience in ECE.

Technology plays a vital role in the acquisition of literacy skills among children. The findings stated that the active use of digital technologies has supported children in the build-up of educational knowledge as well as supporting the literacy experience.

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