

Journal of Smart Tourism

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Editors-In-Chief: Chulmo Koo, Namho Chung, and Ulrike Gretzel

INTERVIEW

- 001** TechTalk Interview about ChatGPT in Smart Tourism with Dr. Buhalis, Dr. Cobanoglu, Dr. Ivanov, Dr. Khoo, Dr. Law, Dr. Pan, and Dr. Rao
| Jeong Hyun Kim, Hyo Dan Cho, Suejung Kang, and Chulmo Koo

EMPIRICAL RESEARCH ARTICLE

- 009** eSports Fan Identity Consumer and Live Game Watching Behavior:
Professional Player Fan Identity Perspective
| Jialing Zhang, Michael Hall, and Myung Ja Kim
- 023** Metaverse Tourism: Elements and Consequences on Tourism Experience Journey
| Dawi Karomati Baroroh, Halim Budi Santoso, and Dewanti Anggrahini
- 035** Getting Smart? A Research Note into Smart Tourism Curriculum and Implications on
Generation Alpha and Beta
| Aaron Tham and Husna Zainal Abidin
- 041** Over the Rainbow: How to Fly over with ChatGPT in Tourism
| Taekyung Kim



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Vol. 3 No. 1 March 31



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Vol. 3 1 No. 1 1 March 2023

Interview

TechTalk Interview about ChatGPT in Smart Tourism with Dr. Buhalis, Dr. Cobanoglu, Dr. Ivanov, Dr. Khoo, Dr. Law, Dr. Pan, and Dr. Rao	1
<i>Jeong Hyun Kim, Hyo Dan Cho, Suejung Kang, and Chulmo Koo</i>	

Empirical Research Article

eSports Fan Identity Consumer and Live Game Watching Behavior: Professional Player Fan Identity Perspective	9
<i>Jialing Zhang, Michael Hall, and Myung Ja Kim</i>	
Metaverse Tourism: Elements and Consequences on Tourism Experience Journey	23
<i>Dawi Karomati Baroroh, Halim Budi Santoso, and Dewanti Anggrahini</i>	
Getting Smart? A Research Note into Smart Tourism Curriculum and Implications on Generation Alpha and Beta	35
<i>Aaron Tham and Husna Zainal Abidin</i>	
Over the Rainbow: How to Fly over with ChatGPT in Tourism	41
<i>Taekyung Kim</i>	



Journal of Smart Tourism

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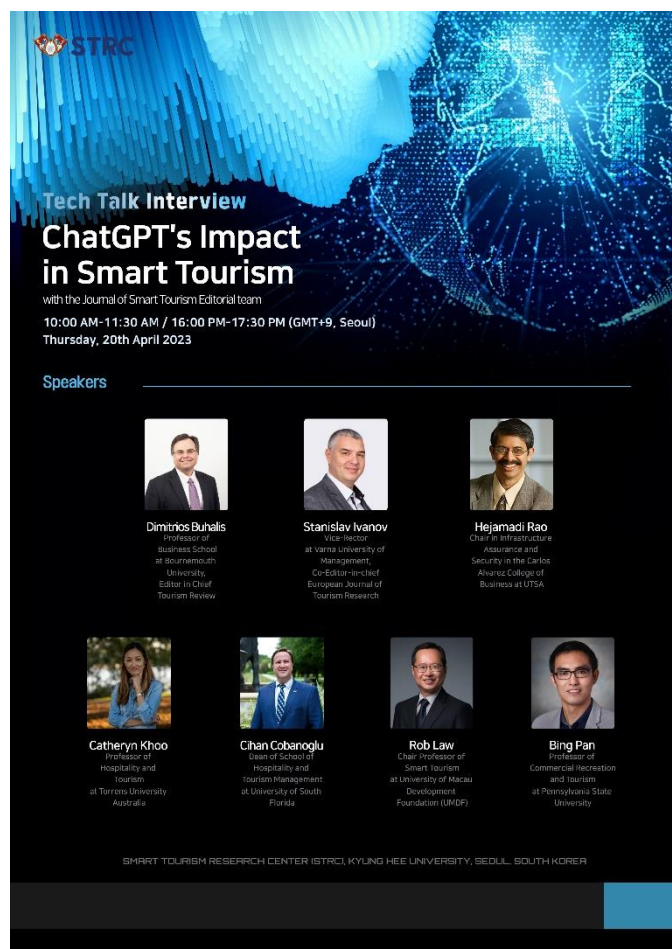
TechTalk Interview about ChatGPT in Smart Tourism with Dr. Buhalis, Dr. Cobanoglu, Dr. Ivanov, Dr. Khoo, Dr. Law, Dr. Pan, and Dr. Rao

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1. Introduction

ChatGPT stands for Chat Generated Pre-trained Transformer, and has attracted attention worldwide. Dialogue-based artificial intelligence (AI) can interact with humans using natural human languages and very human-like conversation as well as written text, showing the ability to talk and provide general and sophisticated answers to users' questions in forms including writing, coding and drawing. Given the rapid adoption of ChatGPT, we need to understand its AI technology, which has become increasingly capable, and the potential of applications to the tourism industry and academia. Will it be a game changer? The potential of AI technology, good or bad, remains unknown. The Journal of Smart Tourism invited scholars to discuss ChatGPT's impact on the tourism industry and academia.

Travelers have used travel websites, search engines, maps, online travel agencies, blogs, and social media for travel planning, recommendation, booking, and sharing, but since ChatGPT can provide a list of potential destinations and recommend a travel plan, travelers may opt to choose ChatGPT suggestions or at least refer to Chat GPT when planning their trip. There are pros and cons: we discuss potential implications and insights that can be gained from scholars about ChatGPT's early stages, which have had practical, theoretical, and phenomenological impacts, as well as informing traveler experiences. In addition, human-like conversations with keyboards indicate that we could communicate with travel agent by turning around dialogue questions and revised questions via either face-to-face or non-face-to-face counselling services in the near future. Some experiments have been conducted, such as that described in the article "Expedia is attempting to integrate ChatGPT from OpenAI into its mobile app so that consumers can receive personalized travel advice." Expedia developed a plug-in for customized travel planning. In comparison, Bing Chat provided specific airport information when users provided their correct departure date. However, since multiple alternatives or activities are very important issues in the travel industry, valid information in the hospitality industry is critical for travelers. ChatGPT needs to provide trustworthy and reliable data that fully convinces travelers.

With the rapid diffusion of ChatGPT in society, business, and academia, hospitality and tourism professionals, including researchers and educators, have to discuss travelers' behaviors when connecting to ChatGPT via the Internet, social media, apps, and smartphones. To address the use of ChatGPT in the hospitality and tourism field, we provide meaningful discussions and contribute to the literature via invited talks with eminent scholars. We conclude with a general discussion covering the ChatGPT phenomenon, along with theoretical, practical, and future research issues.

2. Participants

- Dimitrios Buhalis, Professor at the Business School at Bournemouth University
- Stanislav Ivanov, Vice-Rector at Varna University of Management
- Hejamadi Rao, Chair in Infrastructure Assurance and Security in the Carlos Alvarez College of Business at University of Texas at San Antonio
- Catheryn Khoo, Professor of Hospitality and Tourism at Torrens University Australia

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- Cihan Cobanoglu, Dean of the School of Hospitality and Tourism Management at University of South Florida
- Rob Law, Chair Professor of Smart Tourism at the University of Macau
- Bing Pan, Professor of Commercial Recreation and Tourism at Pennsylvania State University

3. Pros of ChatGPT for the Travel Industry

3.1 Stanislav Ivanov

ChatGPT is part of a bigger group of technologies, which is generative AI. This is an artificial intelligence that generates content. From this definition, you can figure out the actual implications. It creates content. This means that it can create content for the marketing activities of a company. It can create, for example, ideas for a job description. It can create a description of a hotel, but in text format. However, it can also create photos that are quite realistic, although they will not be real photos. It has analyzed the content of a review, quite well, which was published in an article in Buhalis's journal, the *Tourism Review*. With my co-workers, we obtained a review by a customer for a hotel. We presented it to ChatGPT and asked ChatGPT to evaluate, to identify the strengths and weaknesses of the hotel based on this review. And it was quite good. Also, this technology can be integrated into chatbots, and it can provide smoother communication. When we integrate these large language models within retail-based chatbots, they are able to communicate in a more natural language, so they want you to write what you want. They will be able to deliver without many questions needing to be asked. So it would be more human-like behavior.

3.2 Chian Cobanoglu

We are amazed with what ChatGPT can do for the hospitality and tourism industry. One of the best ways of using ChatGPT in travel and the hospitality-tourism industry is content creation for social media. Social media requires a lot of content on an ongoing basis. If you are a restaurant, you can ask it to suggest some recipes. Similarly, a hotel that is focused on wellness can create social media featuring wellness. In addition, tourism bureaus or destination manager organizations are using ChatGPT to write marketing campaigns to inform potential travelers about what is happening at the destination. I have personally seen ChatGPT being experimented with as a virtual travel assistant for people, as part of tourism destination bureaus or destination management organizations that help people to customize their travel. One of the things about ChatGPT is that it learns from the person, and creates these personalized recommendations. I'm very excited to see how it's going to alter the way that we talk and communicate with people because it's very effective in language translation.

This phenomenon is really quite interesting. As I am traveling in India right now, I had one day free. I wanted to get the highlights of New Delhi. When I asked ChatGPT, it gave me several sights and attractions that a tourist must see. What we did before ChatGPT is that we went to Google, Bing, Baidoo. Then we wrote "things to do in New Delhi." But today we depend on ChatGPT. With Google, you can manipulate what it presents by giving ad sense and paying for some keywords so that your attraction or your service appears first. In other words, we are using SEO search engine optimization tools to be able to appear in those searches on the top. Now the question is "What are we going to do to appear in ChatGPT findings or answers? Is it possible to manipulate ChatGPT or is ChatGPT going to actually give people information based on how much money they are getting paid?" These are all wonderful research questions. For example, the itineraries provided by TripAdvisor versus ChatGPT through experimental research, and the impact on consumers, on guests, and on employees from the

supply side, are great research questions.

3.3 Bing Pan

I have limited knowledge about ChatGPT even though I have a paid subscription. I play with it, but I can see the capacity is still limited. However, the scary thing about AI is that it's developing along an exponential curve, which is hard for human beings to imagine or catch up with. Once ChatGPT becomes an infrastructure, that's where its potential can be realized. Imagine you can connect ChatGPT with audio production and simply use your own voice and your own image. I see a lot of potential in the future. I'm using ChatGPT 4, and version five will come out next year. Hopefully they will be more powerful, but again, the exponential curve is what is scary because we are thinking in linear terms.

3.4 Catheryn Khoo

It is scary but it's not there yet. From November 2022 to now, it's been six months, and it's evolved quite quickly. So what's going to be the next three months and the next six months? All of these will evolve very quickly, and we need to be in touch with this as an extension of ourselves. It's human-like, and they can accomplish human-level performance, but still do not have human-level creativity. So for us, as teachers, we still need to train our students to have these analytical and creative skills in order to stay relevant in a world that is relying more and more on AI. I think those two skills are important to get on top of this ChatGPT. Our students will have jobs because these are the two skills that ChatGPT will not have. Allow me to elaborate.

My son sometimes helps customize itineraries. For example, you can say I want to go to Hong Kong, and I'm going to spend three days. Then he goes to ChatGPT to create the itinerary, which he then sends on to these people, who pays him for the research. So my son, and people of his generation, they are making money out of this, and they will be very quick. But when I asked ChatGPT that I'm going to Cambodia this Sunday and to create itinerary for me, this itinerary is not for me. It is not well-suited for a tourism professor, who has seen a lot, who wants to explore something unique, who is interested in social enterprises, and who wants to see women-led businesses. So it's not human-like, and it's not yet analytical to that stage....yet.

3.5 Ivanov

What I can say is that ChatGPT and generative AI in general and artificial intelligence and robotics and automation technologies, they have three types of effects on jobs. Substitution, enhancement and transformation. Substitution means that ChatGPT or other types of technology replace humans. So previously the work was done by humans; now it will be done by automation. Second is enhancement or augmentation. It means that humans are still here but they are more productive thanks to the technology, so they can do more things. And the third is transformation. It means that people are here but they do things in a different way. So practically ChatGPT and generative AI will have three simultaneous effects.

3.6 Buhalis

We are at a crossroads. Everything we knew up to now is changing. And why is it changing? Because for the first time "machine thinks, and machine decides." So far machines have been helping humans to think and decide. And now the machine thinks, and the machine decides. So we are going to a very different era. Honestly, I am a little bit scared of it. Because it is equally promising and threatening. In the sense that, when the machines

decide, and if the machines have got all the knowledge of the world, then, we're going to the "stupidization" of humans. In fact, it's happening already. If you'd like me to drive from my home to my office, I used to be able to do it with maps and things like that. Now I totally rely on GPS. And the GPS is so much better than humans because it knows all the alternatives, has real-time information and has got even information about how much petrol I spend and what is more environmentally friendly. So you know, I've seen it all. I think this is a bigger thing than internet development, which I remember in the 90s. I was finishing my PhD, as you said, and I was writing about technology.

4. Cons: Security Issues for the Travel Industry

4.1 Raghavendra Rao

As a cyber security researcher, I take a slightly different perspective. The dark side is that we will probably find a lot of phishing attacks and other types of social engineering, which essentially can dupe users into revealing passwords, financial information, or other sensitive data. Nowadays it's becoming even more dangerous because you have authentic-sounding text that can be bumped out quite easily with no human effort required. It is important to know that OpenAI has built some safety into ChatGPT. For example, if you ask it to write malware or a fishing email, ChatGPT will tell you that it is not allowed to do it and that it has to follow strict ethical guidelines. Depending on the ingenuity of the hackers and the people on the dark side, that may not be difficult to get around. Because it knows too much, cyber criminals can use that to work around safety matters that have been put in place. So we find these things going on all the time, and in the context of smart tourism, it is quite possible that you might have fake reviews galore. Also, if you have fake reviews, then that is going to have a very detrimental impact on the tourism industry. That is something that really needs to be looked at in substantial detail to minimize the chances of getting scammed. I'm quite sure that with the immense advances that we are seeing with these large language models, it may well be pretty soon that we see the end of smart tourism. So that's something that we really have to think about. We have to understand that we probably have to educate the customers that these things are possible. There are things that are going on in the dark space, which we as academics don't know anything about. But it is critical that we think about these things.

The perceived level of trust and perceived accuracy and preciseness is quite a critical issue in ChatGPT. We don't completely believe yet, but people pretend to trust the information ChatGPT provides because it provides a human-like conversation.

4.2 Rob Law

The whole world is now very excited, but personally I am not too excited about this one. I am still unsure whether ChatGPT is a concept or a tool. If it is a tool you go for a life cycle and will die out. People won't mention it anymore. But if it is a concept it may last for a long time so I'm still waiting to see whether this is a tool or a concept. To answer your question, it is a bit too early to discuss the eventual outcome. Personally, I would say, just like what Catheryn said earlier... if we wait for a few more months, probably towards the end of this year or early next year we can have a better answer to my question about whether this is a tool or a concept.

I commented that in 2012 when the smartphone spread worldwide, at that time apps also become the mainstream application for everybody and then surprisingly the volume and number of reviews on TripAdvisor went straight up with the emergence of mobile applications. But at this moment, ChatGPT is mostly installed on desktops instead of smartphones. It is not mobile yet but sooner or later, ChatGPT will be operating on your

smartphones just like apps. At that time, what do you think will happen when the world is heavily impacted by ChatGPT?

4.3 Buhalis

It's now getting to a situation where it may be a network of companies who are doing things. We are going to a very different environment. I'm trying to train my brain not to think how we used to a few years back. But if you're old enough to remember, a lot of companies that you used to work with, to support, that disappeared. As you know I used to be a photographer: Kodak, Aqua, Fuji films, all these guys have disappeared right? So, technology is not different in the sense that whoever you value they're going to go forward. The question is who are the people that are going to give you value? And the question is what we need. I think the most important things are what we need to write, what we need to think, what we need to educate. Our students need to look at it in order to be able to be successful in the future and actually create benefits for society: not necessarily for someone's pocket, but benefits for society. And how do we create regulation and how do we create a legal framework that allows good things to happen but also enables the protection of different citizens?

5. Recommendation: Comparing ChatGPT vs. TripAdvisor

In general, TripAdvisor recommendations are more mainstream and commercial-oriented. Tourism customers really enjoy their suggestions and reviews. Will recommendations by ChatGPT be equal to that kind of commercial-oriented online reviews? We trust and depend on TripAdvisor reviews for previous experience from other customers. And they are mostly considered trustworthy in terms of price and accuracy. Then, as you know, ChatGPT emerged. But the issue of hallucination remains. What are your opinions about the comparison between ChatGPT and other commercial platforms?

5.1 Law

For verification, some information can be inaccurate, and some information could even be wrong. In that case we need to verify with the search engine to find things.

5.2 Khoo

You talked about trustworthiness of the reviews on TripAdvisor. But again, the reviews on TripAdvisor are also very subjective. It could also be biased according to that particular traveler and the mood, perception, and the lenses through which he or she experiences a service delivery. I don't see it being very different from ChatGPT, and in fact, I think ChatGPT would be a little bit more objective in its evaluation of reviews of these places except for the fact that Rob Law mentioned that they could be fake reviews. But again, we've had fake reviews even before ChatGPT. In addition, the algorithms of the ChatGPT are only as unbiased as the data that they are trained on. So if the data is biased, then it will be biased.

6. Trustworthiness vs. Hallucination

One of the big issues in ChatGPT is hallucination, which is something untrue that ChatGPT just creates. It simply makes up a story as if it is true, and people perceive it as true.

6.1 Raghavendra

So Catheryn just pointed out about the availability of data and if data itself is not good and not clean, then that is going to have an impact on the biases that are going to come out. That is a fundamental issue that is ongoing, and people are thinking about it very actively. One of the classic examples in marketing is that houses for sale that are shown to black people are quite different from houses for sale that are shown to white people. So there is a clearly a bias, and the bias is probably because of the data that is available and the data on which ChatGPT is being trained on. But beyond the subtle biases, which are not specifically input by humans, you have this issue of disinformation being utilized actively, which is a completely different game and also more dangerous. So there could be dangerous hallucination as opposed to non-dangerous hallucination. There are various risks, and once you have some kind of transparency and accountability, that is obviously going to be beneficial to everyone. But it is critical, as these large language models evolve, to become more integrated and to prioritize its accountability as you mentioned.

6.2 Pan

When I asked for a summary of ethics in AI research with reference, it gave me a ton of references that were all made up. There's no such paper. My understanding is that this is a language model, and it's predicting the next word from the previous trillion data sets. I think that's how hallucination happens. It is a probability model. In terms of the role of fact-checking, the conversation we have with ChatGPT is a fact-checking process. If you ask ChatGPT and it gives you wrong information, I would say "This is wrong. Dr Bing Pan is in Penn State. Give me more accurate information." Then it will evolve. Another philosophical question is the term 'fact'. What exactly is fact? Fact can be debatable. You say today's temperature is 70 degrees Fahrenheit. But could it be 70.1 or 70.2? Perhaps there is no fact but just opinions. Many common opinions become a fact if many people repeat the same thing.

6.3 Ivanov

It is normal to have hallucinations because hallucination practically means generating content that is not correct although it could convincingly be good. Humans are also quite good at generating incorrect content about what to say about AI. Also, AI is trained for creating content and not to fact-check whether this is true or not. So probably at one point, it will be the new digital policy whether this is creating problems for the tourism industry. Hallucination is a temporary thing. We will pass this probably quite quickly. Not sure how quickly but definitely this is going to decrease. By the way, every time you ask ChatGPT about something, you can vote whether this was acceptable with a thumb up or thumb down. So, this means you provide feedback to the algorithm and if it is wrong, you can provide information and explain. So next time it will probably be able to provide a little bit more correct information; not exactly a factual answer but it least it will be much better than the previous one.

7. Travelers in Foreign Destinations

ChatGPT has improved my spoken and written conversation. From a tourist perspective, tourists in South Korea are always concerned and afraid when traveling abroad because of the language barrier. With ChatGPT, it will help South Korean people travel more easily.

7.1 Khoo

There are advantages to ChatGPT but there are also a lot of

disadvantages. One of it is the breaking down of language barriers. On a surface level, it is a good thing, but I'm not sure if it really is because tourism has always been an activity where we travel, and the whole fantasy and ideal about tourism is that it's exotic. We see something new, we learn a different culture, and we struggle with the language. At the end of the day, when we talk about smart tourism, it's not the AI that makes tourism smart - it's the people that know how to use the AI. In other words, we have to talk about smart people who know how to use AI and to maximize its efficiency in improving our quality of life, not to dumb us down and not to take the easy way out. I think that's an important message in using ChatGPT.

8. ChatGPT and Robotics/Humanoids

8.1 Raghavendra

I think that's still far into the future because there's so many things that need to be taken care of. While it is possible to get good voice and image, to get to incorporation into a robot; that to me is not something that will happen in the next couple of years. It'll probably take at least now another five six years before that can happen. In fact, the first robot that I saw in the public domain was in Incheon, and the robot came and greeted me in English. So I assume that it realized that I was not Korean and therefore greeted me in English. But those are very minor things because that is just greeting in English.

8.2 Cobanoglu

Microsoft is using the natural language of ChatGPT to control a range of robots with simple text comments. In other words, normally to be able to control a drone or robot requires sophisticated programming language; however, ChatGPT is serving as an API between humans and the robot. I don't think it's going to take eight to nine years, but it's going to take probably months, if not days. ChatGPT's integration of our lives is as impactful as when the internet came into our life.

8.3 Law

As a consumer, not a researcher or a professor or a scientist, if I am just a hotel guest, I will welcome all kinds of technologies or tools that can make my life easier. But, in terms of traveling, you mentioned that Korean people seldom go out of the country because of the language barrier. But why don't we think from another perspective? How about the travelers from Western countries when they travel to Asia? How does it happen? How can ChatGPT do it the other way around?

8.4 Koo

One of the issues that needs to be addressed in Seoul, South Korea is that people complain that Korean language is difficult to communicate on the street. Tourists always mention the language barrier. Thanks to ChatGPT, language will no longer be an issue. Korea's tourism market will be enlarged.

8.5 Ivanov

We should not talk about the future with the terms of the past because ChatGPT is the present. Robots are the present, but integration of technology is something that has already been happening for many years. And definitely, this merger is inevitable

and not something that is not going to happen. It's inevitable. And robots will be able to communicate, and this will probably improve human-robot interaction because with this robot here, the interaction is quite limited whatever you programming to do.

8.6 Khoo

I would like to see this scenario turned the other way around. That is, if Cihan goes to Korea, then ChatGPT will help him to speak Korean. This way, we do not have just a mono language across the globe; and English isn't the lingua franca, and we still have our own cultures and languages. I think this would be exciting, and would using AI for good, to counter postcolonialism in tourism spaces.

But if I can add to this discussion on robot and ChatGPT, it's not that far actually. I research women in tourism and gender in tourism. We talk a lot about sex tourism. In sex tourism, the idea of sex bots is not new. In fact, it has been in discussion since 2014, and in the last two years this has taken on and has evolved very quickly. The first blue print of sexbot is already in place. You can unpack a sexbot, and it's already been forecasted how much of a billion-dollar industry it is. So it is moving incredibly fast.

9. Integration with Traditional Systems

9.1 Khoo

Our industry is less predictable than how a restaurant runs. We are a global industry, and we have distribution challenges that is a lot bigger and on a larger scale. People are booking rooms, booking cars, and ChatGPT at the moment depends on these stable data in order to manipulate our decision making. So our industries' data is too fragmented for ChatGPT to use. But they might be fixing these as we talk.

9.2 Pan

My understanding is that it is one huge and humongous model which relies on trillions of data to train the model. If we're talking about a customizable ChatGPT, that might be doable. You can connect your inventory with language-friendly ChatGPT, which can translate the hard numbers into user-friendly language. I think there's a potential there.

9.3 Ivanov

ChatGPT can boost productivity and improve the customer experience. For example, you could integrate large language models into chatbots, or you could connect them to the internet so that they can have more up-to-date information. So practically ... we will have more or less integration of these large language models into different applications, probably also including TripAdvisor but not only TripAdvisor: Bookings.com and many other apps in order to provide smoother communication, better value for customers. Practically, companies will integrate these large language models. They will provide better service, better value to their customers and they will be more competitive compared to companies that do not use them.

9.4 Buhalis

I've been looking into CRS (Central Reservation System) as well as GPS (Global Positioning System) and all the rest of it for many years. And I think what's happening in the industries is we have got legal systems and a lot of the industry people have failed to update to the new realities and understand what the new

realities are. And I think that is a very dangerous situation. If you don't understand what's going on you'll become like others, you'll be extinct. And other people who'll come in and they'll be much more up to date, and they'll get you into different places and all the rest of it. Ten to 15 years ago, this did not exist. Ten to 15 years ago a lot of other agencies were taking all this business. So, we really need to look into how we can use this technology in the future and how we can make all these technologies attractive. No question, a lot of the industry is going to disappear, and a lot of new industry is going to appear. The trick is to be on the right side of history because if you are on the wrong side of history you will disappear.

9.5 Cobanoglu

I have personally used ChatGPT to purchase a ticket from Miami to Istanbul. I asked what's the best time to buy. It gave me some tips. It tells you the best time to buy a plane ticket. It gave me three weeks in advance before traveling for my particular dates, which helped me to secure a ticket that was half the price of what I normally would have bought. So I assume that, without knowing too much about this technically, it's going to allow us to be able to get inventories and optimize price adjustments or revenue management.

At this moment, ChatGPT just provides information, but that information will be actualized seamlessly connecting to the back systems (Computerized Lodging System and Property Management System). They will reveal the inventory in time, offer available seats, and optimized routes. The travel industry will change abruptly. Meanwhile, tourism operators and agencies are likely to disappear.

10. ChatGPT for Academia

10.1 Cobanoglu

I have provided a sentence about ChatGPT in my course syllabus. I allow students to use ChatGPT. However, I do not allow them to copy and paste. It is perfectly fine for them to be able to find ideas, to be able to articulate their own ideas, and to help them think critically. That's number one. Number two, I believe that this is definitely going to change the way we educate people, not because of ChatGPT but because it has already started to happen. We are moving slowly from degree-based programs to skill-based programs. So ChatGPT is definitely going to play a huge role in education, and we should use ChatGPT to help us with the content. In my opinion, as educators, ignoring ChatGPT or banning ChatGPT is not the right solution. We need to embrace it and use it as a tool.

10.2 Khoo

In terms of teaching and our use in the classroom, we cannot avoid it because the more you ban students from doing anything, the more likely that they will do it. Also, it is a phenomenon, and it is a reality. It is a sign of the change of times and technology, and we have to embrace it. If we don't know how to embrace it, we ask our younger research or teaching assistants or the younger generation to come and we learned from them. Younger generations have different ideas of work, compared to our idea of work. Work has changed, and people have more nomadic lifestyles now. ChatGPT is just going to help it, and if we stop it, we will not win this conversation. But I have faith in people and the humans who are programming ChatGPT and AI. Even now Google is already looking into cryptographic software to detect plagiarism, and they will penalize content that is plagiarized. Hence I have faith in the system that humans are smarter than AIs and robots. There is no choice but to have faith in the intelligence of human beings in our

judgement. This philosophical conversation around how we use it better and how we maximize efficiency but not take away our human-ness is the most important question. We still need to be human even though everything is AI in hospitality, and everything is robotic, and customer service is now offered by service bots. But we still need to know when to use them and when NOT to use them. Where are the human touch points? I think those are still important and we need to teach our students these issues.

10.3 Raghavendra

One place where I can see it contributing to education is by being a digital tutor. If it allows students instant feedback and guidance, that will be particularly beneficial to students who are having trouble with their work. It can help bridge the gap between students with varying degrees of literacy and because ChatGPT can use adaptive learning platforms, that can be utilized for individual needs based on individual progress. I can see that it could have potential, have a positive effect, and play quite a big role in enhancing educational equity, particularly in under-served areas.

10.4 Ivanov

As an editor, I don't have a problem with using ChatGPT as long as it is not a co-author and it is only humans who are authors. If ChatGPT provided wrong answers, wrong analysis, wrong calculations, or something else wrong, it is not ChatGPT's fault. It is the author's fault because they need to check.

11. Censorship Issue in ChatGPT

11.1 Pan

They train humongous amounts of data online. I am sure some people are going to check what happened in 1989 in Tiananmen Square, which is against some laws in China. This can slow down the development of large language models in China because you cut out a part of history.

11.2 Koo

I also think that mainland China wants to create an AI just like ChatGPT and compete against the US. ChatGPT collects data from the internet and other information sources. But mainland China is a huge country with a huge population. If information is only from China, in that case, there would not be much diversity in the information or different information compared to the US or other parts of the world. Could that be a competitive strategy in the long run?

11.3 Pan

I think they allow the model to crawl information from the Western world but maybe block off certain facts. If that's the case, they have diversity. So I don't think that's an issue, maybe only with a small proportion of information.

11.4 Law

This is a multicultural world. Not every piece of information is suitable for every single country. I want to go back to your education question. I was thinking something very fundamental. What is the purpose of education? The purpose of education is the process of imparting or acquiring general knowledge, developing

the powers of judgement, and generally of preparing oneself or others intellectually. If that's the purpose of education then should we be using some way that can improve the process of learning and teaching and how do we achieve that goal? We should welcome any tools or methods that can help us enhance this process.

11.5 Ivanov

First about the students and then we'll go back to the research. Regarding students, I know that many universities are banning the use of ChatGPT. In our university, we allow ChatGPT to be used for two modules. One is research methods and statistics, and the other one is technologists in tourism and hospitality. Students are allowed to use this for their assignments but the only thing they need to do is to acknowledge they have used ChatGPT in the acknowledgements for the methodology section. If they do not acknowledge that they used it they fail. My logic is that first, we cannot do something without having data. We need to have informed decisions, data-driven decisions rather than emotions or based on prejudices or assumptions, because we are part of a real world, part of education management, not part of a religious institution. However, from my perspective, this is not using ChatGPT education for students to write the assignments. This is not a problem and so they're not a problem because ChatGPT is more than a calculator. We already use different tools. We use tools for translations, we use tools for proofreading, and we use tools for generating content. I see an added cost here. So it is another application and there are many applications you can use to generate ideas to polish the content.

12. Conclusion

The tourism and hospitality industry has been a vital sector of the global economy that continues to face numerous challenges and opportunities. Using technology and innovation, the industry is finding ways to overcome traditional barriers and create new possibilities for growth and development. Tourism academics play a critical role in advancing the industry's knowledge and understanding, with research topics ranging from sustainability and tourism impacts to service quality and customer satisfaction. Furthermore, ChatGPT, as a language model based on the latest advances in artificial intelligence, can provide valuable insights and support to academics and industry professionals (Carvalho & Ivanov, 2023). With its ability to process vast amounts of data, generate accurate predictions, and deliver personalized recommendations, ChatGPT is a powerful tool for addressing the complex issues facing the tourism and hospitality industry today and in the future. By leveraging the latest technology and academic research, the tourism industry can continue to evolve and thrive in an increasingly competitive and uncertain global marketplace. The emergence of artificial intelligence has already revolutionized the tourism industry in recent years. Therefore, by inviting well-known researchers in the field of tourism and hospitality, the experts' discussions have been organized to reveal the potential of ChatGPT to transform various aspects of tourism, from customer service to business operations and to propose the benefits and challenges of implementing ChatGPT in tourism, the role of humans in utilizing ChatGPT, and the future of AI in the tourism industry.

"Who controls this tool, generative AI and for what purpose?" – Dr Buhalis

As for the impact of disruptive technologies such as ChatGPT, Dr Ivanov and Dr Buhalis both recognize that we are at a crossroads, where machines are now able to think and decide for themselves. As Dr Buhalis and Dr Khoo point out, AI can be used to create personalized experiences for tourists by analyzing their

preferences and behaviors. This can lead to increased customer satisfaction and loyalty. Furthermore, AI can be used to streamline operations and reduce costs, as highlighted by Dr Ivanov. Dr Cobanoglu also believes that it is going to allow us to be able to optimize price or revenue management. Dr. Koo thinks that ChatGPT is more user-friendly and human-like in conversation than Google Translate and predicts that Trip Advisor might adopt ChatGPT in the future. Dr Pan notes that there is potential for ChatGPT to be used in creating virtual travel guides and personalized recommendations. By automating tasks such as booking management and customer service, businesses can improve efficiency and profitability. While this offers many promising possibilities, it also presents some challenges and threats. The predictive and reactive technologies of the future may create solutions for users before they even realize they need them, which can be beneficial or potentially dangerous depending on who controls the tools and for what purpose.

"What exactly is fact? Facts can be debatable. There's no fact, just all opinions. Many common opinions become facts if many people repeat the same thing." - Dr Pan

The discussion revolved around the negative aspects of ChatGPT, which can generate inaccurate content, and the importance of human expertise in fact-checking and adding original details. The issue of hallucination in ChatGPT arises, and the panelists discussed the fundamental issue of biases and fairness in the data used to train ChatGPT. They also discussed the danger of disinformation being actively utilized, which is a completely different game and more dangerous. Overall, they noted that ChatGPT is still in its early stages, and it will continue to improve over time, but human expertise is still critical in ensuring the accuracy of the generated content. Regarding the regulation of ChatGPT, Italy has already blocked it and other European countries may follow suit due to concerns over regulation and potential harm. Likewise, Dr Law is not particularly excited about ChatGPT and sees it as a potentially short-lived tool rather than a lasting concept. He believes that it is too early to discuss the eventual outcome and suggests waiting a few more months to see whether it is a tool or a concept. Furthermore, Dr Rao, a cyber security researcher, believes that large language models like ChatGPT can be used to create convincing phishing attacks and social engineering scams that can dupe users into revealing sensitive information. He suggests that educating customers about these risks and thinking about potential threats is critical. He also warns that the immense advances in large language models may soon bring an end to smart tourism.

"Is ChatGPT a lasting concept or a potentially short-lived tool?" - Dr Law

"With the immense advances that we are seeing with these large language models, it may be pretty soon that we see the end of smart tourism" - Dr Rao

The impact of Chat GPT on the academic and educational world is significant (Skavronskaya et al., 2023). The use of ChatGPT by students is allowed in some universities with the requirement to acknowledge its use, while others have banned it. It has the potential to revolutionize academic writing and research by assisting in the generation of ideas and improving the efficiency of the writing process. However, it also raises concerns about plagiarism and the authenticity of research output. The panelists agree that it is important for editors and researchers to establish guidelines and regulations to prevent misuse and plagiarism. ChatGPT can also facilitate multilingual communication and collaboration, making research more accessible and inclusive. Therefore, ChatGPT has both positive and negative impacts on the academic world, and it is up to researchers and editors to balance the benefits and risks of using AI tools in academic work. However, after all, as Dr Law emphasizes, as the purpose of education is to

develop intellectual powers and judgment, any tools or methods that can help enhance this process should be welcomed.

"We need to embrace it and use it as a tool, as opposed to just maybe one ultimate one." - Dr Cobanoglu

All participating scholars confirmed that the integration of ChatGPT with existing technologies in the travel and tourism industry is inevitable, and it can bring about significant changes and improvements in the industry. However, it is important for individuals and organizations to adapt to these changes and stay updated with the latest technological developments to remain relevant and competitive in the industry. Dr Buhalis emphasized the importance of keeping up with technological developments to stay relevant and not become extinct. Dr Ivanov further discussed the possibility of combining ChatGPT with robots and how it can enhance human-robot interaction. In this context, the role of humans in utilizing AI in tourism was also discussed. While AI has the potential to replace certain jobs, it was emphasized that humans will still play a critical role in utilizing AI. As Dr Ivanov highlighted, humans who do not use AI could be replaced by those who do. Thus, it is essential for individuals to upskill and adapt to the changing technological landscape.

"You would be humans using AI. We will replace humans that do not use AI" - Dr Ivanov

"It's not the AI that makes tourism smart. It's the people that know how to discerningly use AI" - Dr Khoo

Looking to the future, the conversation highlighted the need to focus on the bigger picture rather than individual technological advancements such as ChatGPT. ChatGPT is just a small peak in the generative AI wave, which is a small peak in the AI and robotics wave, which is just one wave in the larger context of technology. Therefore, it is important to frame research in the context of generative AI and focus on the larger technological advancements in the industry, as Dr Ivanov proposed. The dialogues shed light on the possible advantages and hurdles associated with the integration of AI in the tourism sector. The significance of taking into account ethical concerns, improving skills, and adopting a wider perspective was underscored. The discourse exemplifies the need for cooperation between academic and industrial sectors in devising and executing AI remedies for tourism. It is probable that the progress of AI will determine the future of the tourism industry, hence it is imperative for both businesses and individuals to accommodate and brace themselves for this technological transformation.

Declaration of competing interests

The author(s) declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Empirical Research Article

eSports Fan Identity Consumer and Live Game Watching Behavior: Professional Player Fan Identity Perspective

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Abstract

This study investigated whether the Point of attachment (POA) theory can be used to measure the consumption intention on go and watch offline eSports games. The admiration for players, social interaction, and on-site consumption requirements for viewing offline eSports competitions are prioritized. In addition, eSports fans in various regions may have distinct consumption concepts and consumption patterns. Thus, this study surveyed China (n = 156) and South Korea (n = 127) eSports fans who subjectively perceive themselves to be fans of eSports player(s) and who have observed at least one offline eSports game. The results demonstrate that player attraction and socialization have positive and significant effects on offline consumption factors. There is no correlation between previous consumption behavior and satisfaction, but dining shows a significant positive effect on satisfaction. Moreover, there is a strong relationship between satisfaction and future attendance intention. In addition, effect of eSports fan attachment on future visit intentions are measured and there is no correlation between the two variables. The front end of the path in the new model's varied between Chinese and Korean supporters. Finally, theoretical and practical implications of this study are discussed.

Keywords

eSports; sports; point of attachment (POA); eSports tourism; sports mega events; eSports industry

1. Introduction

Sports industry consumption has changed as spectator sports continue to grow (Scholz et al., 2020). There are numerous ways for sports consumers to spend their discretionary funds and time (Byon et al., 2013). Although the ultimate objective of marketing model research is to predict consumer attitudes and behavioral intentions, it is also crucial to comprehend why consumers purchase particular products and services (Cohen & Warlop, 2001). Sports competitions are now closely associated with universalism, transcendence, heroism, rivalry, individual motivation, and teamwork (Rowe, 1995; Smith, 2006). With the rapid expansion of the eSports industry, an increasing number of individuals have a sustained interest in eSports competitions (Xiao, 2020). Those unfamiliar with eSports may find it challenging to comprehend this new and complex industry that combines sports, culture, technology, and business (Jenny et al., 2017; Jin, 2010). eSports is a combination of computing, gaming, media, and sporting events that is dependent on the Internet platform (Jin, 2010). The globalization of the professional sports market is crucial for the expansion of the sports industry. As emerging sports become professionalized, it is beneficial to apply proven traditional sports models to emerging sports in order to comprehend the motivations of spectators with the "new

identities" (Byon et al., 2013).

Newzoo (a premier professional eSports data company) defines esports viewers as those who observe professional eSports content at least once per year. They may consist of both core eSports fans and non-core observers. Spectator motivation is a general potential component of the sports scale that applies to fans. Spectator motivation is a general potential component of the sports scale that applies to both fans and spectators. Spectator motivation suggests that consumers of sporting events can appreciate the aesthetics, drama, entertainment, pertinent knowledge, and physical performance in games (Trail et al., 2003a). These motivations have been identified by scholars as significant predictors of the consumption behavior of sports fans. Despite the fact that these scales have been widely used in traditional sports versus eSports competitions research, there is little variation between these factors of attendance decisions (Funk et al., 2009; Kim et al., 2013; Prayag et al., 2020).

Typically, products about sporting events are divided into two categories. The first is the core service, which pertains to the actual content of games. Consumption associated with competitive content is frequently attributed to market demand (Byon et al., 2013; Greenwell et al., 2002; Kim et al., 2009). The general premise of somatic psychological theory is that people are drawn to sports because they are enjoyable. The majority of these

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enjoyable spectator or fan behaviors satisfy social or psychological requirements (Robinson & Trail, 2005; Trail & James, 2001). The extended product, on the other hand, generally refers to the ancillary services associated with sporting events, such as ticket services, stadium services, game facilities, transportation, food and beverage, parking, and lodging (Mullin et al., 2007; Zhang et al., 1995). The variables related to core service elements and peripheral service quality have rarely been studied simultaneously, even though the results of these studies have demonstrated the significance of core service quality and peripheral service quality separately (Byon et al., 2013).

POA research emphasizes the multiple manifestations of attachment in sports fandom, such that fans with varying POAs exhibit distinct sport-related behaviors (Trail et al., 2003b). Current research on this theory focuses on how sports fans perceive their identities (Trail & McCullough, 2020; Trail et al., 2003b), as well as the psychological connections that fans form because they have a special bond with a team (or a player, coach, or even league, etc.) (Wann et al., 2001; Spinda et al., 2016). According to Frederick et al. (2012), after establishing this perception, sports fans typically engage in (para)social interactions with their favorite athletes on social media. Fans with a high level of attachment may seek a community that reflects their likability (Spinda et al., 2016; Kassing & Sanderson, 2010). At this point, the majority of POA's influence on sports enthusiasts has been concentrated on the traditional sports domain and what they do on social media. Spinda et al. (2016) report that the availability of the eSports realm is still seldom mentioned. Meanwhile, eSports tournaments are gaining popularity as a new form of sport tourism for eSports fans on brief or extended trips. However, in terms of offline consumption, POA theory has not received the attention that it deserves. Consequently, we believe it is necessary to investigate the offline consumption of eSports in preparation for future attendance, as well as to investigate the applicability of the "quality value - consumption paradigm" to the eSports industry and compare it through the cross-cultural comparisons (Byon et al., 2013). Although the correlation between identity and attendance has been established, there is a paucity of pertinent research on those who explicitly identify themselves as eSports fans (Laverie & Arnett, 2000). Following the foregoing logic, we would like to address the following 2 questions with this thesis:

Q1: Does POA theory apply to measuring consumption intentions related to offline eSports competitions?

Q2: Whether there are regional differences in the consumption behaviors and intentions of eSports fans?

In order to solve the problems mentioned above, the purpose of this study is to develop a new model to determine whether the attraction between "player - fan" and "fan - fan" at the core of eSports fans has a positive impact on expanding product consumption, and whether this additional consumption has a positive impact on the relationship between satisfaction with watching offline eSports tournaments and future engagement intentions. To explore the existence of geographical differences in eSports tournament culture, eSports fans from two different countries (China and South Korea) were surveyed separately.

2. Research Background

2.1 eSports

Jenny et al. (2017) proposed a comprehensive definition of eSports: eSports are organized video game competitions. The debate on whether eSports can be considered a sport can be traced back to 1999, even though the majority of scholars currently recognize eSports as a sport (Gestalt, 1999). In fact, eSports conforms substantially to the foundational definitions of eSports sociology (Guttmann, 1978) and sport philosophy (Suits, 2007). Players of eSports are intrinsically motivated to engage in

this activity, and their intention is to have fun (Guttmann, 1978). Moreover, formal eSports competitions are organized, competitive, institutionalized, and followed by diverse audiences. Professional eSports athletes are responsibly managed by the Governing body. They have greater technical and physical fitness than average players (generally, traditional sports emphasize gross motor skills, whereas eSports requires fine motor skills), and their competitive activities generate the required energy expenditure Energy Expenditure (EE) (Guttmann, 1978; Jenny et al., 2017; Suits, 2007).

Another crucial metric is whether eSports can be recognized by major international multi-sport competitions. In 2020, the Olympic Council of Asia (OCA) confirmed that eSports will be a medal event at the 2022 Asian Games in Hangzhou, China. Eight games, including FIFA, PUBG, Mobile and Arena of Valor, Dota2, League of Legends, Dream Three Kingdoms 2, HearthStone, and Street Fighter V, have been announced officially¹. While the debate over the inclusion of eSports in the Olympic Games continues, the Asian Games of 2022 have taken a historic step by recognizing the "sports status" of eSports games (Kates & Clapperton, 2015).

2.2 Why Do People Go and Watch Offline Esports Games ?

As a central component of sporting events, eSports viewing motivation has been extensively discussed. Relevant research primarily focus on the consumer appeal of eSports game content (Pizzo et al., 2018; Xiao, 2020). Although motivation is linked to attendance or attendance intentions, motivation has been held responsible for the small amount of variance in some studies, including that of Funk et al. (2009). To measure and predict various aspects of sports consumer behavior, researchers have developed sports motivation scales from a variety of perspectives over the years. Early developments of sports consumer consumption scales included the Sport Fan Motivation Scale (SFMS; Wann, 1995) and Motivations of the Sport Consumer (MSC; Milne & McDonald, 1999). The Motivation Scale for Sport Consumption (MSSC) devised by Trail and James (2001) and the Sport Interest Inventory (SII) scale created by Funk et al. (2001) measure the psychological motivation of sports audiences by examining their consumption motivation. Currently, in addition to measuring traditional sports events, the scales are also used to assess the consumption behavior of eSports fans (e.g., Hamari & Sjoblom, 2017; Pizzo et al., 2018; Xiao, 2020).

The POA theory has received a lot of attention in traditional sports watching motivation research, in addition to the various consumption motivation scales. Most of the POA studies on sporting events have focused on the interactions between POA elements, the relationship between game viewing motivation and POA factors (Kim et al., 2013; Robinson et al., 2004; Trail et al., 2003b), the premise that sports fans produce different conferences/divisions or different teams of POA perception differences (Kamath et al., 2021; Spinda et al., 2016) loyalty or revisit (Kwon et al., 2005; Prayag et al., 2020). Many researchers have demonstrated that identification is an important predictor of exercise behavior (Lock et al., 2014). Attachment points represent an entity's psychological connection. And, attachment points are not just single elements or one-dimensional. Multiple perspectives or the investigation of the logical relationships between multiple attachment elements should also be considered (Kirkup & Sutherland, 2017). The research of these two scholars confirms that motivation leads to distinct attachment sites (i.e., event and location attachment), which in turn influence participants' positive attitudes toward or loyalty to the event or location. Sports fans typically experience multiple types of identification. For example, researchers have proposed the points of attachment index (PAI) --- a model for measuring POA (Spinda et al., 2016). The reaction of sports fans to these programs in

¹ <https://olympics.com/en/news/fifa-pubg-dota-2-esports-medal-events-asian-games-2022>

different contexts is partly a reflection of their agreement with these POA programs (Trail et al., 2003b; Kwon et al., 2005). The model focuses on factors such as sport, level of sports play, favorite team, player or coach, conferences/divisions, and impact of the team on the whole sports community (Spinda et al., 2016; Kim et al., 2013).

Most of the previous research on sports consumption has concentrated on team sports in traditional viewing settings (Robinson et al., 2004). However, as online information dissemination capabilities continue to improve, the influence of sports star effects also trends to grow. eSports has transitioned from an Internet phenomenon to live-action mega events, while maintaining its presence by communicating with the outside world via multiple online channels (Jenny et al., 2018). Moreover, social interaction attracts spectators to sporting events (Ridinger & Funk, 2006; Wann, 2006). Social interaction provides opportunities for expanding relationships and socializing among unfamiliar sports fans, thereby enhancing their sense of belonging and social status (Fisk, 1992; Wann & James, 2018). One of the requirements for widespread new popular sports is having a sizable and diverse following (Suits, 2007). With the rise of teams, tournaments, leagues, bonuses, management, and sponsorship deals, a new culture of competitive video gaming has emerged within the eSports industry (Crawford & Gosling, 2009).

2.3 Consumption Behavior of eSports Fans

Numerous studies have investigated fans who actively compete in eSports (Lee et al., 2014; Hamari & Sjoblom, 2017). Much of the research focuses on the behavior of consumers who watch eSports games (Seo, 2016), comparison of eSports and traditional sports watching motivations (Lee & Schoenstedt, 2011; Pizzo et al., 2018), suitability of eSports and sports advertising (Lehnert et al., 2022), and identification level with favorite eSports teams and players (Cushen et al., 2019). Sjoblom and Hamari (2017) examined multiple eSports fan motivations as predictors of event content consumption metrics, including eSports game watching. Some motivations, such as the effect of specific emotions on motivation, cognitive and social integration, exhibited positive predictive levels, as indicated by the study's findings.

Due to the unpredictability of sports appeal, researchers believe that the aesthetic nature and presentation of sports will increase the potential appeal of sports games (Hinch & Higham, 2005). These contents provide authentic and meaningful experiences for sports fans and directly or indirectly influence the intensity of their personal investment in sports objects (Crawford, 2004; Giulianotti, 2002). Therefore, some extremely committed sports fans may devote a great deal of time and energy to watch sports events, which have been shown to generate a great deal of vigor and enthusiasm (Smith & Stewart, 2007). Additionally, papers on eSports viewing motivations emphasize the significance of the emotional experience of consumers. These elements fulfill several crucial psychological (escape, stimulation, entertainment, sense of collective honor, personal identity, national pride), social (sports anniversaries, sports atmosphere), and cultural (cultural celebration) requirements (Hamari & Sjoblom, 2017; Kim et al., 2013; Smith & Stewart, 2007; Xiao, 2020). Open Systems Theory (OST), a commonly cited open system theory in the study of sports venues, holds that the operation of sports organizations is inexorably heavily influenced by the surrounding environment (Bastedo, 2004). According to Amagoh (2008), if a sports facility wishes to retain its long-term appeal, it must combine economic, political, and social factors in order to maintain an interactive environment within the organization. Most sports facility operators design their business strategies to entice consumers to engage in activities. Consequently, with the increase in the number of sports fans visiting venues to watch eSports games, satisfying consumer needs has become a crucial service objective for sports facilities

(Amagoh, 2008; Jenny et al., 2018).

2.4 Collective Fan Identification Differences

Personal identity and societal identity make up one's self-concept (Tajfel & Turner, 2004). Identification is described by Trail et al. (2000) as the orientation of the self toward other things, such as an individual or group, which results in feelings or emotions of close attachment. This attachment is not exclusive to a particular group or individual. Sports fans may regard any memories associated with the sport as a point of attachment (Robinson & Trail, 2005; Trail, 2000). Experts found that a sports fan's likelihood of attending a sporting event increases with their level of optimism. They typically maintain a very stable degree of personal motivation for participation (Kim et al., 2013).

Scholars are interested in the connection between divisions as a possible area of POA research expansion. Currently, researchers identify differences between POA programs by measuring the degree of adherence of sports supporters of various teams to the accomplishments and standing of every team in the league (Smith & Stewart, 2007; Spinda et al., 2016). For instance, Spinda et al. (2016) used the seven-factor PAI model to look at how various fan identities of sports fans experience different kinds of identification as well as team loyalty. The findings demonstrate that all categories are consistent with the theoretical latent factors. According to Kim et al. (2013), it is imperative to conduct research to determine the best way to mediate the motivation-sport consumer behavior connection. They examined divisional college football teams within the context of college sports to determine if sports consumer identification levels enhance the predictive power of motivation. The findings showed that the connection between motivation to engage in physical exercise and willingness to attend is moderated by the overall structure of identification. between motivation to engage in physical exercise and willingness to attend is moderated by the overall structure of identification.

3. Hypothesis Development and Research Model

3.1 Interactivity and Consumption of eSports Fan

In addition to the appeal of game content to eSports aficionados, player-related content also plays a significant role in satisfying their psychological aesthetics (Hamari & Sjoblom, 2017). In some studies pertaining to the consumption of traditional sports competitions, a greater emphasis is placed on the physical attractiveness of the participants. These studies examine the physical attractiveness of athletes in relation to their physical performance during exercise (Trail & James, 2001). Hamari and Sjoblom (2017) devised a more pertinent explanation for physical attraction in the field of eSports in their 2017 study. They believe that although the content of eSports occurs within the realm of the electronic system, the vast majority of eSports events document the entire process of players, from pre-match to post-match interviews, on video (Brandes et al., 2008). Some prerecorded recordings, as well as the facial expressions, hand movements, and interviews of eSports players during the live broadcast, can provide fans with the opportunity to learn more about each player. The more consumers know about sports celebrities, the greater their appreciation. A sports celebrity's reputation should be based more on past performance and personal charisma than on actual game ability (Mullin & Dunn, 2002). Hausman and Leonard (1997) believed that sports stars have a unique personal appeal that allows them to pique the interest of supporters even if the team's actual competitive level has not improved significantly.

In the field of eSports, it is commonly believed that aesthetic satisfaction can be provided by players and games separately. The eSports fans are highly motivated to watch games to learn about

players, teams, and eSports events (Cushen et al., 2019). Additionally, they frequently assemble a fan base on their own to back their preferred players or teams. Scholars have observed that unique experiences frequently captivate the interest of fans (Horne, 2017). These experiences may involve the participation of a star player, memorable interactions, or exhibition games (Smith & Stewart, 2007). The coaching staff, players, and referees primarily display the game's core service quality to the audience (Zhang et al., 2004). Since inter-divisional or inter-national competition involves the overall success of a league. Therefore, sports fans who have high league affiliations may also show fondness and support for teams or players representing their country in international competitions (End et al., 2002).

The experiences of sports tourists are linked to social interaction (Kim et al., 2013). The social nature of sporting events provides specific cultural communities with a meeting place (Wann et al., 1999). The locations of offline eSports competitions can be regarded as a common destination for sports enthusiasts, a meeting place, and a culturally shared space (Smith & Stewart, 2007). It's important to strengthen a feeling of belonging through social connections with others who have similar interests (Fink et al., 2002). Motivations for social interaction at sporting events reflect individuals' desires to engage with groups and to be a part of organizations with which they share similarities (Wann et al., 1999). Wann (2006) concluded in a follow-up study that a preference for a particular sport may be one of the most influential factors influencing social welfare. Identifying with a high-performing sports team and its players can also improve supporters' social connections and mental health (Reding et al., 2011; Wann, et al., 2011). Also, this effect may be amplified when a sports fan is surrounded (through family or community ties) by individuals associated with their favorite sports (Spinda et al., 2016). As a result, it is important to investigate the interaction between POA and the factors of identification-social psychological health. Social support among sports fans will become one of the factors most likely to be widely considered. Sports fans are significant competing attachments for attending sporting events, and social support among them is going to be one of the most widely considered factors. When a sports enthusiast develops a stronger attachment to an athlete, they may develop a (para)social communication relationship (Spinda et al., 2016). Therefore, the hypothesis that follows is suggested:

H1a: Player attraction has a positive impact on the socialization of eSports fans

In numerous settings, perception of value has been identified as a mediator of the relationship between service quality and behavioral intentions (Byon et al., 2013; Cronin et al., 2000; Murray & Howat, 2002). All these research findings indicate that perceived value is strongly correlated with service quality and behavioral intentions. When sports consumers hold strong attitudes toward the attributes of a game's primary product, these attitudes may result in subsequent actions (Byon et al., 2013). Trail et al. (2003a) examined the future behavior of sports consumers by measuring four variables: watching and attending future games, purchasing team memorabilia, purchasing team-licensed products, and supporting the team. The findings indicated that these behaviors positively affect repurchase intentions and word-of-mouth. personal dispositions determine the emotional states, behavioral responses, and evaluations of individuals, which are substantially influenced by environmental stimuli (Mehrabian & Russell, 1974). Typically, Sports fans frequently pay for mementos, even though some of it is impractical or even crude (Booth & Tatz, 2000; Smith & Stewart, 2007). Currently, categories of consumer goods derived from eSports players and eSports events are expanding rapidly.

The theory of environmental psychology emphasizes that accumulated stimuli can be used to induce emotional states, influence evaluations, and direct consumer behavior (Mehrabian & Russell, 1974). As soon as a sports fan decides to observe the next game, the process of accumulating anticipation begins. Uhrich and Koenigstorfer (2009) investigated the application of

environmental psychology to sporting events in a study. They believed that environment approach is a desirable behavior that demonstrates consumers' interest and preference for the environment. Sports fans desire to improve their performance and remain or return to this environment in the future. Due to the allure of sporting events, many sports fans will travel frequently and far to observe a game of interest (Wann et al., 2001). A "complicated" travel itinerary may include transportation, the natural scenery of the game location, and dining. Although the event itself is the primary reason for travel, the value-added effect of travel to and from the destination and during the stay cannot be ignored from a global perspective (Kahle et al., 1996; Smith & Stewart, 2007). The following two hypotheses are proposed:

H1b: Player attraction has a positive impact on the beforehand consumption of eSports fans

H2a: Socialization has a positive impact on the beforehand consumption of eSports fans

Numerous studies have confirmed the "halo effect" of celebrity athletes (Brizek, 2002; Kim et al., 2020). Sports star-themed restaurants, restaurant chains offering commemorative merchandise, and game-related content during events have the potential to increase restaurant attendance and attract sports enthusiasts (Brizek, 2002). In a related case study conducted by Brizek (2002), Applebee's promoted its neighborhood grill and bar theme by displaying local "heroes" or sports figures in an atrium area that represented the community. This significantly attracts followers of the sports star's team to spend money at the store. The gathering of fans in the store establishes a cultural space for offline fan communities in this instance. Fans with a stronger sense of identity are more deeply integrated into their self-concept, more likely to observe games, travel further and make other local purchases, purchase merchandise, and remain loyal (Smith & Stewart, 2007; Fink et al., 2002).

Game support/operation programs are used to describe auxiliary services during sporting events (Zhang et al., 2004). Unlike the teams that deliver the event's primary content, team management for sporting events focuses on the additional product features of the competition (e.g., ticketing services, physical and functional character of the arena or stadium and intermission facility activities) (Smith & Stewart, 2007). Although most consumers accept these additional services (some of which may be unnecessary) in order to enjoy the event's primary content, the quality of game support items frequently impacts the overall operation of sporting events (Byon et al., 2013). Researchers have suggested that the quality of peripheral services associated with game support items may influence audience consumption levels (Brooks, 1994; Zhang et al., 1998). A growing number of eSports fans are choosing to make short-distance or even long-distance travel arrangements to attend the growing number of offline eSports events. Some eSports competition locations are currently being constructed. For instance, Shanghai, China is building the Shanghai International NCC & E-sports Center, a comprehensive sports venue with the primary goal of holding eSports contests, including training venues for the entertainment department, conferences, eSports education, entertainment, and dining facilities. As such venues continue to proliferate, the higher the quality of services related to eSports tourism, the more attractive eSports destinations will be for offline consumption by eSports fans. The following two hypotheses are proposed:

H1c: Player attraction has a positive impact on the dining consumption of eSports fans

H2b: Socialization has a positive impact on the dining consumption of eSports fans

3.2 Satisfaction and Future Attendance Intention of eSports Event

It has been discovered that eSports event satisfaction is related to gaming contents and additional service satisfaction (Jang et al., 2020). In studies concerning traditional sports consumption, consumer contentment is defined as the customer's

positive and gratifying reaction to the ancillary services provided during the entertainment and/or gaming of a sporting event. Service satisfaction refers to the extent to which consumers are satisfied with the services they receive at sporting events (Yoshida & James, 2010). According to studies, sporting products have a substantial effect on game enjoyment and the desire to participate in future sporting events (Kwon et al., 2005; Zhang et al., 1998). Only offline consumption provides the opportunity to experience the true ambiance (Neus, 2020). Customer perceptions of primary products and supplementary services may coexist as predictors of customer satisfaction and behavior intentions. Even previous studies have concluded that ancillary services (e.g., stadium staff) may be a more accurate predictor of customer satisfaction than primary products (Greenwell et al., 2002). Yoshida and James (2010) examined sports consumers in the United States and Japan and determined that stadium personnel and facility access are significant predictors of service satisfaction. Accessibility to stadium facilities has a positive effect on customer service satisfaction from a match management perspective. Consequently, the following two hypotheses are proposed:

H3: Beforehand consumption has a positive impact on the offline eSports game watching satisfaction

H4: Dining consumption has a positive impact on the offline eSports game watching satisfaction

Individuals' behavioral intentions are considered as an indication of their willingness to perform a specific task. Such that, the clearer an individual's intention, the more likely it is that the expected behavior will occur (Ajzen, 2005). The findings of Kwon

et al. (2005) suggested that sports fan cognition, satisfaction, and future attendance intentions can be predicted by team-related attachment. According to Trail et al. (2000), affective states are comprised of happiness and contentment. In other words, a sports fan is more satisfied after an event, the more likely he may engage in future fan behavior (Trail et al., 2003a). In the major studies, the behavioral intention of sports consumers reflects behaviors like repurchase intention and word-of-mouth communication. Scholars believe that propensity to recommend services to others and repurchase intentions are the most significant general behavioral intentions (Byon et al., 2013; Zeithaml et al., 2006). When the fundamental psychological requirements of eSports fans are satisfied, their enjoyment of the game and their desire to attend future games are enhanced (Przybylski et al., 2010). Therefore, the following hypothesis is proposed:

H5: Offline eSports game watching satisfaction has a positive impact on the future attendance intention

In studies pertaining to eSports, behavioral factors have been discussed. Existing research has examined consumption viewing time, game time, and variables including game publishers, event organizers, and eSports teams (Hamari & Sjoblom, 2017; Ryan et al., 2006; Sjoblom & Hamari, 2017). Since revisits are influenced by the tourism location attraction. Thus, we set an exogenous variable to explore whether the frequency of offline eSports game watching as of the survey affects future revisit intentions. The specific research model is shown in Fig. 1.

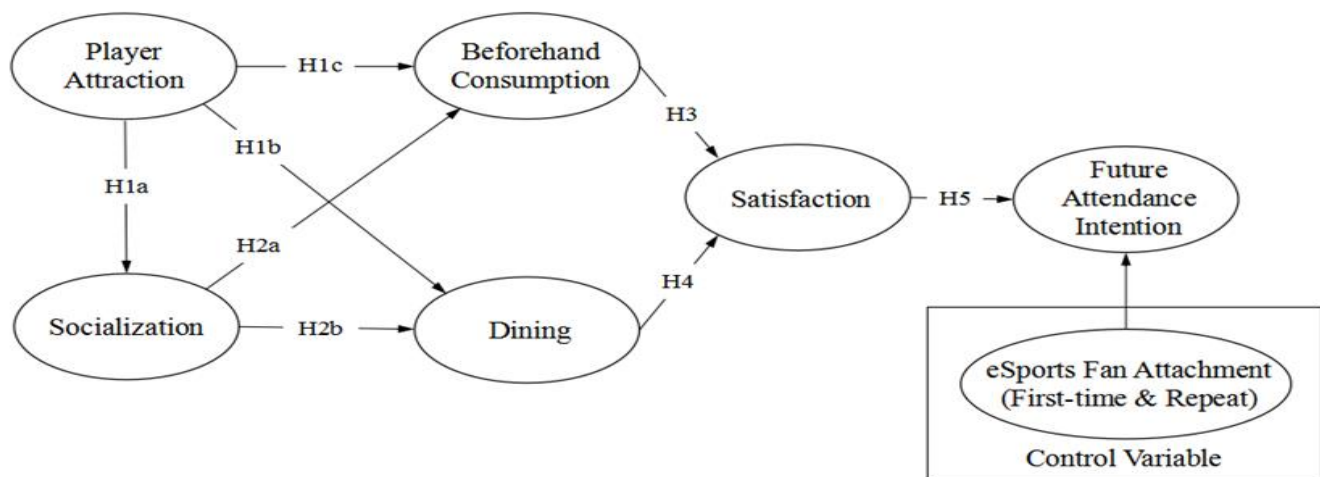


Fig. 1. Research model

4. Research Method and Analysis

4.1 Survey Measures

The majority items of the questionnaire's queries were adapted from previously validated multiple contents to prevent measurement inaccuracies (Churchill Jr, 1979). The survey questions included 23 items organized into 6 structures. Each item, excluding the intention to visit in the future, contains four inquiries (contains 3 questions). Queries regarding player attraction and socialization were borrowed and modified from Pizzo et al.'s (2018) study on eSports game watching. The research on sports enthusiasts' consumption for the ambiance of the scene and offline eSports competitions summarizes the majority of the project's pre-consumption behavior content (Jenny et al., 2018; Neus, 2020). Nishio et al. (2016) provided the information for the dining section. To measure satisfaction and future attendance

intentions, items from Xiao (2020), Paek et al. (2021) and Trail et al. (2013) were implemented.

4.2 League of Legends game

One of the most well-known eSports competitions is LOL, which draws a sizable audience (Jenny et al., 2018). On November 6, 2022, approximately 10,000 spectators congregated at the Chase Center Arena in San Francisco for the LOL 2022 Global Finals. Concurrently, the peak viewers of global online viewers reached approximately 5.15 million, while the average number of viewers reached 980,000.² Currently, millions of fans attend various venues to witness professional eSports competitions. Typically, eSports professionals are positioned in the center of the stage in front of desktop computers, live-streaming their activities to stadium screens. eSports tournaments are held all over the world, but the largest professional tournaments are held in the

² <https://escharts.com/tournaments/lol/2022-world-championship>

United States, Western Europe, China, and South Korea (Jenny et al., 2018).

4.3 Data Collection

Traditional sports are extremely concerned with the extent to which sports consumers identify with their own spectator roles (Wann, 2002). This study aims to measure perceptions of eSports consumption interest and eSports fan identification. In terms of team and player, this variable refers to the degree of psychological attachment supporters have with the team or player (Wann & James, 2018). Identification levels are critical predictors of fan emotional, cognitive, and behavioral responses, according to a wide range of research (Dietz-Uhler & Lanter, 2008; Cushen et al., 2019). Current POA theory research continues to emphasize motivation and participation willingness (Ballouli et al., 2016; Kwon et al., 2005; Spinda et al., 2016). The propensity to return to both the destination and the activity has also been a topic of discussion for some academics (Kirkup & Sutherland, 2017). In actuality, however, the POA's perspective on the overall consumption behavior of sports fans (including the dining and associated goods in addition to tickets) has not been considered. Therefore, we conducted an investigation into the logical connection between motivation, consumption behavior, gratification, and future visitation intent. Considering the fact of offline eSports tournaments in Asia, the LOL leagues in China (CN) and South Korea (KR) have over a decade of experience hosting professional tournaments and a relatively established league structure. This study focuses on the eSports fans in these two nations who appreciate watching LOL matches. Considering that the new model suggested in this study is intended to assess the actions and potential future involvement of eSports fans who erroneously think that they have the status of player fans. In the screen question section before the formal initiative, three screen questions were set. (1) Have you ever attended an offline eSports game? (2) Are you familiar with the basic rules of LOL game? (3) Do you consider yourself a devotee of one or more eSports athletes? The participants in this study were chosen based on their affirmative responses to all three queries.

The construct queries consisted of 6 factors (player attraction, socialization, beforehand consumption, Dinning, satisfaction, Future attendance intention) and 1 exogenous variable (eSports Fan Attachment). All factors except future attendance intention (3 questions) consisted of 4 questions. This section utilized a 7-point Likert scale, with 1 indicating complete disagreement and 7 indicating complete agreement (Dawes, 2008). Participants were instructed to indicate their agreement or disagreement with each question. The fourth section consisted of six demographically pertinent questions: gender, country of residence, age, marital status, education, monthly income, and eSports fan attachment (first time & repeat). All of the items in the questionnaire are based on content from pertinent prior research on the English language (Xiao, 2020; Trail & James, 2001; Hamari & Sjoblom, 2017; Jenny et al., 2018; Jang et al., 2020). Due to the multilingual character of this study's respondents, the initial questionnaire was created in English. The document was then translated by two professionals who spoke English, Chinese, and Korean, respectively. The Chinese and Korean versions were then back-translated into English, and differences between English and Korean expressions were rectified. A native Korean and a Chinese speaker evaluated the content validity of the survey questions in the two translated versions.

This study was conducted with eSports fans in China (CN) and South Korea (KR) who know the basic rules of the LOL game and have been to an eSports match at least once. The survey of Korean respondents was conducted from December 5 to December 20, 2021. For Chinese respondents, the survey was conducted from January 3, 2022 to February 1, 2022. The questionnaire for this study was difficult to conduct in an offline

survey because of the pandemic. Therefore, in this study, the questionnaires for both China and Korea were conducted online. A leading market research firm Macromill Embrain (www.embrain.com) was commissioned to do the Korean part of the survey in order to obtain potential respondents in Korea, and a quota sampling method was implemented. The Chinese portion of the survey was distributed through the Wenjuanxing website (www.wenjuanxing.com) and Weibo (<https://www.weibo.com>), one of the most popular social media platforms in China.

We collected 1066 questionnaires in total. They were comprised of 485 Koreans and 581 Chinese individuals. The response rate was 37.4% overall. Before distributing the questionnaire, we devised screen questions and attention questions and promised to compensate respondents who completed the questionnaire thoroughly. After discarding the questionnaires that did not correspond to the study's target demographic, those that did not make sense (continuous selection of the same options, completion of all questions in 1 minute and incomplete responses more than 5 minutes) were also disregarded. With a response rate of 41.6%, 200 valid questionnaires were obtained for the Korean eSports fans. With a response rate of 34.3%, 199 valid questionnaires were collected for the Chinese eSports fans.

4.4 Data Analysis

4.4.1 Sample Characteristics

A total of 283 usable surveys were completed. Male respondents accounted for 71.4% and female respondents accounted for 28.6% of the overall sample. 55.1% of the respondents were from China and 44.9% were from South Korea. Approximately 4.9% of the respondents were 18 or younger, 21.9% between 18 and 20 years of age, 29% were between 21 and 23, and 21.9% were between 24 and 26. There are 84.8% of the respondents were single and 15.2% were married. Among the respondents, 28.6% have a monthly income of \$2,000 to \$2,999. About 36.7% of the respondents went to watch offline eSports games 2 or 3 times, 26.5% only watched offline eSports games once time and 24.4% watched offline eSports games 4 or 5 times. The respondents' detailed demographics are reported in Table 1.

Table 1. Demographics. (n = 283)

Variable	Content	Frequency (%)
Gender	Male	202 (71.4%)
	Female	81 (28.6%)
Country of Residence	China	156 (55.1%)
	South Korea	127 (44.9%)
Age	18 or Younger	14 (4.9%)
	18-20	62 (21.9%)
	21-23	82 (29.0%)
	24-26	62 (21.9%)
	27-29	43 (15.2%)
	30 or Older	20 (7.1%)
Marital Status	Single	240 (84.8%)
	Married	43 (15.2%)
Education	High School Diploma or Lower	30 (10.6%)
	College School or Degree	54 (19.1%)
	4-year University Attending or Degree	180 (63.6%)
	Graduate School Attending or Degree	17 (6.0%)
	Doctoral School Attending or Degree	2 (0.7%)
Monthly Income (In KRW or RMB)	\$1,999 or Below	63 (22.3%)
	\$2,000 - \$2,999	81 (28.6%)
	\$3,000 - \$3,999	66 (23.3%)
	\$4,000 - \$4,999	37 (13.1%)
	\$5,000 or Above	36 (12.7%)
eSports Fan Attachment	Once	75 (26.5%)
	2-3 Times	104 (36.7%)

(First time & Repeat)	4-5 Times	69 (24.4%)
	5-7 Times	8 (2.8%)
	7 Times or More	27 (9.5%)

4.4.2 Measurement Model

In this study, we separately surveyed South Koreans and Chinese who had watched offline eSports games and identified themselves as fan of professional eSports player(s). We used the Partial least squares structural equation modeling (PLS-SEM) analysis to examine the proposed measurement and structural models and to test the proposed hypotheses in this study. As respondents were asked to rate all survey questions simultaneously, common methodological differences needed to be considered. Therefore, Harman's one-way test was conducted as a post hoc statistical test to confirm the presence of common method bias in the outcome dataset (Harman, 1967). An exploratory factor analysis (EFA) was conducted on all 23 measures and unrotated factor solutions were examined. In this process, the issue of common method bias arises when a single factor is present or when a factor accounts for more than 50% of the variance of a variable (Podsakoff et al., 2003). The EFA results depict six variables (eigenvalues > 1), each dimension explaining between 4.935% and 39.476% of the covariance between

measures. Since no single factor accounted for more than 50% of the covariance, it was concluded that the measurements in this study did not have a serious problem of common method bias.

We first evaluate the measurement model by the validity and reliability of the constructs. Convergent validity assesses the strength and significance of the loadings, the average variance extracted (AVE), and the reliability estimates (Kim et al., 2011). In the analysis, all AVEs were greater than 0.50, exceeding the recommended threshold (Fornell & Larcker, 1981). Thus, these results provide strong evidence for convergent validity. Next, construct reliability was assessed by internal consistency and indicator reliability. At the same time, the satisfactory reliability in this study was achieved for all factors (Cronbach's alpha > .70). Then, internal consistency was assessed using Dillon-Goldstein's rho, the values ranging from .849 to .925 (Table 2). Finally, the Heterotrait-Monotrait ratio of correlations (HTMT), procedures superior to the commonly considered criteria (Fornell & Larcker, 1981), and cross-loading were assessed (Henseler et al., 2015). The results showed that all HTMT values for the potential variables were below the critical and conservative value of 0.85 (Table 3). The results indicate that, overall, these scales are valid and reliable measures of their respective constructs.

Table 2. Measurement item properties

Construct	Items	Loading	alpha	CR	rho_A	AVE
Player attraction	I think it was exciting for me to meet eSports players in person.	0.738				
	I watched carefully when footage of eSports players appears on the screen.	0.792				
	I thought the eSports players I like are more attractive than the others.	0.713	0.762	0.765	0.849	0.585
	I thought excellent eSports players look more handsome than others.	0.811				
Socialization	I enjoyed the social relationship aspect of offline eSports game watching.	0.751				
	I could share satisfaction with others when watching offline eSports games.	0.780				
	I went to watch offline eSports games to meet other fans.	0.790	0.776	0.779	0.855	0.597
	I went to watch offline eSports games to meet other fans I have known online.	0.769				
Before hand consumption	I would like to buy souvenirs by the online way before watching offline eSports game.	0.753				
	I would like to buy souvenirs around the venue before watching offline eSports game.	0.795				
	I would like to buy banners before the eSports game to cheer up the teams/players.	0.826	0.819	0.827	0.879	0.645
	If necessary, I would like to reserve a place in a restaurant or hotel room around the venue before watching.	0.866				
Dining	I thought the food around the venues is easy to find.	0.866				
	I think it's important to have good restaurants around the eSports venues.	0.837	0.892	0.893	0.925	0.755

	I am very concerned about whether there are tasty foods around the eSports venues.	0.862				
	I really anticipate the food and restaurants around the eSports venue.	0.909				
Satisfaction	I was satisfied with the offline eSports game watching.	0.820				
	I was pleased with the experience of offline eSports game watching.	0.863	0.855	0.856	0.902	0.697
	I think my decision to go and watch the offline eSports game was a wise one.	0.827				
	I don't think I regretted investing my time and money to watch offline eSports games.	0.828				
Future attendance intention	I intend to go and watch the offline eSports game in the next season of League of Legends.	0.908				
	I plan to go and watch the offline eSports game in the next season of League of Legends.	0.880	0.877	0.883	0.924	0.802
	I probably will go and watch the offline eSports game in the next next season of League of Legends.	0.899				

Table 3. Heterotrait-Monotrait ration of correlations (HTMT)

	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)
(1) Beforehand consumption	5.110	1.066						
(2) Dining	5.070	1.223	0.430					
(3) Player attraction	4.983	1.140	0.596	0.630				
(4) Future attendance intention	5.302	5.302	0.490	0.661	0.646			
(5) Satisfaction	5.389	5.388	0.352	0.625	0.576	0.821		
(6) Socialization	5.413	5.412	0.535	0.594	0.587	0.695	0.691	

4.4.3 Testing the Hypothesized Structural Model

5000 times of PLS-SEM bootstrap sampling tests were used in this study. The variance inflation factor (VIF) was used to diagnose the multicollinearity of each independent variable. The values of VIF for all items in this study ranged from 1.307 to 2.538, satisfying the requirement that the value of multicollinearity needs to be less than 10. The corrected R^2 values are the explanatory power of the predictor variables for the respective structures. To verify the accuracy of the structural framework, the R^2 of the variance of satisfaction (0.314) and revisit intention (0.51), located in the end part of the study model, was calculated as the predictive power. In addition to the R^2 analysis, Stone-Geisser's Q^2 values (Stone, 1974) were calculated to assess the predictive relevance of the model in this study. Q^2 assesses the predictive validity of the model by skipping some indicator values using the calculated parameters. The difference between the skipped data points and the predicted data points is the basis for the Q^2 calculation (Chin et al., 2008). A Q^2 greater than 0 implies that the model has predictive relevance, while a Q^2 less than 0 is interpreted as a lack of predictive relevance. The Q^2 values for all the important factors in this study ranged from 0.119 to 0.403 and were all greater than 0.

Fig. 2 shows the structural relationships assumed in this study and the results for the control variables. Among the control

variables considered in this study, most of the independent variables have a strong positive effect with the dependent variable. In terms of the results, beforehand consumption has no direct effect on the intention to the satisfaction of watching an offline eSports game (H3). Other than that, the remaining seven main hypotheses were all supported, as shown in Figure 4. The results showed that player attraction had a positive effect on the beforehand consumption (H1a: $\beta = 0.353$, $t\text{-value} = 3.697$, $p < 0.001$), dining (H1b: $\beta = 0.363$, $t\text{-value} = 5.612$, $p < 0.001$) and socialization (H1c: $\beta = 0.463$, $t\text{-value} = 7.964$, $p < 0.001$). The socialization of eSports fans also had a positive effect on the beforehand consumption (H2a: $\beta = 0.277$, $t\text{-value} = 2.919$, $p < 0.01$) and dining (H2b: $\beta = 0.337$, $t\text{-value} = 5.022$, $p < 0.001$). Beforehand consumption showed no significant effect (H3: $\beta = 0.124$, $t\text{-value} = 1.458$, $p > 0.05$) but dining (H4: $\beta = 0.502$, $t\text{-value} = 6.855$, $p < 0.001$) was positively influenced the satisfaction of the experience of watching the eSports game. Finally, the satisfaction was significantly influenced the revisit intention (H5: $\beta = 0.714$, $t = 12.819$, $p < 0.001$).

In addition, we measured the reliance of eSports fans, i.e., whether offline eSports games attachment as a separate control variable has an effect on future attendance intention. As a control variable, eSports fan attraction ($\beta = 0.073$, $t\text{-value} = 1.221$, $p > 0.05$) did not influence future attendance intention.

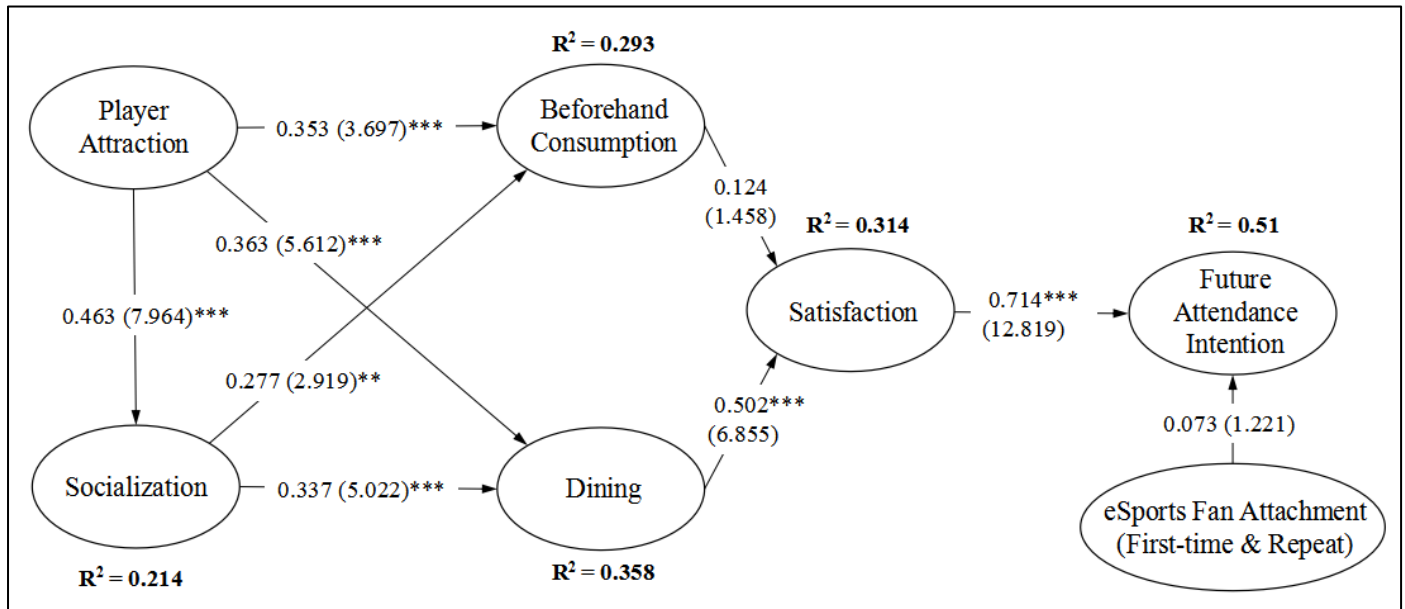


Fig. 2. Result of the structural model
Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

4.4.4 Group Comparison between China and South Korea eSports Fan

In this study, we separately surveyed Koreans and Chinese who had watched offline eSports games. In order to demonstrate that the specimens collected from two different countries (200 cases in Korea and 199 cases in China) could be analyzed together, we performed a chi-square test. The results showed $\chi^2 = 30.516$, $df = 18$, and $p\text{-value} = 0.33$, which implies no difference between the two data sets (Cochran, 1952).

POA study also mentions interregional differences and cultural differences (Smith & Stewart, 2007; Spinda et al., 2016). During the data collection phase, two separate countries (China and South Korea) eSports fans were surveyed to investigate whether regional or cultural differences in eSports influence the

path coefficient of fans with “player belief” who observe offline eSports competition models. The results of the analysis are shown in Table 4.

From the analysis results, it is evident that fans of eSports in China and South Korea exhibit distinct differences. player attraction showed positive effects on socialization ($\beta = 0.269$, $p = 0.032$, $p < 0.05$), beforehand consumption ($\beta = 0.445$, $p = 0.015$, $p < 0.05$) and dining ($\beta = 0.335$, $p = 0.007$, $p < 0.01$). Moreover, according to the results of multi-group analysis, the data comparing Chinese and South Korean eSports enthusiasts are all positive (+), as shown in Table 4. In other words, Chinese eSports fans showed a stronger willingness than South Korean eSports fans on the three factors of player attraction influence presented in this study.

Table 4. The comparison result (CN vs KR) of PLS Multi-Group Analysis (MGA)

Paths (CN vs KR)	Difference Coefficients	P-value	Results
Player attraction → Socialization	0.269	0.032*	Supported (CN > KR)
Player attraction → Beforehand consumption	0.445	0.015*	Supported (CN > KR)
Player attraction → Dining	0.335	0.007**	Supported (CN > KR)
Socialization → Beforehand shopping	-0.332	0.065	Not Supported
Socialization → Dining	-0.121	0.318	Not Supported
Beforehand consumption → Satisfaction	-0.208	0.227	Not Supported
Dining → Satisfaction	0.236	0.124	Not Supported
Satisfaction → Future attendance intention	-0.029	0.797	Not Supported

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

5. Conclusion

The eSports industry is obtaining increasing consumer interest. As a burgeoning industry, the current marketing model for eSports imitates traditional sports paradigms in novel and innovative ways (Scholz, 2020). However, not enough research has been conducted on the consumption of eSports fans with strong fan identity perceptions who observe offline eSports matches. This study measures the contribution of eSports fan-centered attraction and interaction to offline consumption by developing a new research model based on POA theory, which has

not been extensively discussed in the eSports industry. In addition, it is investigated whether offline eSports viewing satisfaction and future participation intentions are positively influenced by consumption behavior.

Several key conclusions can be drawn from analyzing the questionnaire data. Firstly, player attraction has a positive effect on socialization. In other words, the more they perceive themselves to be fans of professional players, the greater eSports consumers' propensity to communicate and interact with others in the field. Secondly, the attractiveness of players to eSports supporters and social interactions among eSports fans have a

positive effect on their pre-consumption and accommodation consumption behaviors. This implies that a high degree of identity perception can facilitate eSports fans' consumption behavior at the game site. Thirdly, it was determined that *ex ante* consumption behavior has no positive influence on satisfaction. This may be because individuals who perceive themselves to be fans do not need to contribute to the experience by purchasing souvenirs or cheering banners. Finally, contentment influences future viewing intentions positively. At the same time, the data suggest that eSports game exposure (i.e., the number of times they have viewed an eSports game) does not have a direct influence on future intentions to return. The intention to attend a future eSports game is not influenced by prior viewing history for either eSports fans who have only watched a single eSports match or those with extensive prior watching experience.

5.1 Theoretical Implications

Due to the rapid expansion of the eSports industry, an increasing number of academics are discussing this emerging field. Efforts by eSports organizers to link video game competitions to real-world consumption have not been adequately quantified and studied so far. In addition, discussions based on a clear understanding of fan identity are still woefully insufficient. This study develops and evaluates a new eSports consumption model to explore the consumption behavior of eSports consumers who perceive themselves having a player identity and observe offline matches. The model investigates the relationship between identity perceptions and consumption behaviors and the influence of these behaviors on satisfaction and future engagement intentions (including the influence of eSports supporter contact as an exogenous variable for future visits) is discussed. In addition, it is assumed that eSports consumers in various sub-divisions may have distinct community cultures and consumption patterns. This study investigates Chinese and South Korean eSports enthusiasts and compares them across multiple groups. The results demonstrated that the other paths of the model were supported and exhibited a strong correlation, except for the effect of antecedent consumption behavior on satisfaction, which was found to be insignificant. Observing the eSports fan interaction element had no discernible effect on future visitation intentions. However, there were partial differences between the consumption patterns of eSports enthusiasts in the two countries.

Focusing on esports fans' offline eSports consumption is innovative and theoretically pertinent (Neus, 2020). This research expands and supplements the extant thesis on offline eSports viewing in a variety of ways. This study investigates whether POA, an extensively discussed theory in traditional sports, can be applied to offline eSports game watching behavior. This broadens the numerous applications of POA theory (Kamath et al., 2021; Kim et al., 2013; Robinson et al., 2004; Trail et al., 2003b). In addition, the discussion on the primary and peripheral service quality at eSports tournament sites contributes to the advancement of the relevant research (Zhang et al., 2024; Zhang et al., 1995). Regarding the relationship between the elements of model, the positive effect of player attraction on socialization extends the research on eSports fan behavior (Brandes et al., 2008; Cushen et al., 2019) and sports stars adoration (Hamari & Sjöblom, 2017; Horne, 2017; Xiao, 2020). In addition, this study demonstrates that both player attraction and socialization have a positive effect on beforehand consumption behavior and dining consumption. It suggests that a fan's perception of his or her identity can influence consumption decisions. This section of the model plugs a gap in the research on offline eSports consumption (Mullin et al., 2007; Smith & Stewart, 2007; Trail et al., 2003a; Wann et al., 2001). Beforehand consumption behavior has been shown to have no direct effect on satisfaction when viewing eSports games. This result is consistent with the hypothesis proposed in the study by Jenny et al. (2018) on eSports stadiums. Future visitation intentions were positively correlated with

satisfaction and were unaffected by the previous games attendance experience. This finding extends theoretical studies related to behavioral variables (Ryan et al., 2006; Sjöblom, & Hamari, 2017). Not really much attention has been paid to the diversity of cross-cultural consumption patterns. Examining the distinctions between Chinese and South Korean eSports consumers, this study supplements related theoretical research (Byon et al., 2013; Laverie & Arnett, 2000). Lastly, this study extends the research on possible regional differences in paths induced by eSports culture and consumption habits (End et al., 2002). This study provides a novel approach for investigating the theoretical construction of offline consumption within the eSports industry.

5.2 Practical Implications

This study concentrates on the consumption of eSports fans for practical purposes. The findings of this research can inform the development of offline eSports competitions and the eSports tourism industry. At first, the socialization of fans is influenced by the attractions of players as the primary content provider of tournaments. This necessitates the inclusion of additional opportunities for eSports fans to interact with participants. The greater their sense of interactivity in the field, the more likely they would like to share their positive emotions with others (Cushen et al., 2019). In the case of LOL games, for instance, many regional leagues conduct audience-facing interviews with participants on stage after matches. This made fans a more direct look into the minds of the eSports players they support and extended the "player-fan" interaction beyond the game. Existing research on eSports has paid little regard to previous consumption patterns. Due to the diversification trend in the eSports industry, fan culture-related consumption has emerged as a new industry derived from eSports. There is a vast variety of cultural and creative products available for purchase. They include banners, cheering sticks, crafts, apparel, and even everyday necessities emblazoned with the logos of professional teams or players. Some fans with a strong sense of identity will buy or even collect related items. The results of this study indicate that viewing offline eSports games is not influenced by previous consumption patterns. This indicates that the purchase of retail products related to eSports tournaments, or the booking of lodging and meals close to the venue, has no direct impact on overall service satisfaction. Therefore, the development of eSports cultural and creative products may also extend beyond the concept of products related to live tournaments and be both practical and diverse.

For world-class tournament hosting and organization, eSports fans are willing to travel across town or even across the globe to attend a game of the highest magnitude. There are currently few venues available to host significant eSports tournaments, and the majority of world-class eSports competitions take place in traditional sports arenas. Several countries are in the process of constructing specialized venues to host significant eSports competitions (Jenny et al., 2018). In addition, international differences in fan consumption patterns have been confirmed. This study compares the offline spending habits of eSports enthusiasts from China and South Korea. The result affirms that various eSports cultures and fan groups have distinct consumption patterns. Consequently, a global eSports consumption market can be developed by depicting consumer profiles with diverse user characteristics for the development of targeted sales strategies. Finally, as an exogenous variable, spectator contact with eSports has been shown to have no effect on future attendance intentions. Consequently, it can be presumed that as long as the content quality and league operation model of eSports matches are ensured, offline eSports matches will consistently attract eSports fans to attend future matches regardless of their age.

6. Limitations and Future Research Directions

As this research was conducted during the pandemic, national pandemic prevention policies restricted the hosting of eSports tournaments to online formats. This study's respondents were eSports fans who had previously observed offline eSports games. Depending on the amount of time it has been since they viewed their most recent eSports tournament, some respondents may not recall or be able to provide accurate responses. In the future, when the frequency and attendance of offline eSports tournaments return to pre-pandemic levels, every effort should be made to preserve a fresh and accurate representation of the experience at the time of the survey (Byon et al., 2013). In addition, due to the time and financial constraints of the survey, this study selected Chinese and South Korean eSports enthusiasts from two of Asia's more developed eSports industries and cultures. In future research, the model can be used to measure eSports fans in other regions, such as Europe and the Americas, to investigate more disparate consumption differences among eSports fans.

The rapid growth and development of the eSports industry would attract more investors. There is still ample room for the innovation of offline eSports consumption or eSports tourism development orientation. The attachment to sports venues is a potential factor that warrants additional empirical study in the future (Spinda et al., 2016). Moreover, the perception of a sports supporter's identity is not limited to the player fan perceptions discussed in this study. The team perception is also one of the most frequently mentioned factors in recent research on the identity perceptions of sports fans (e.g., Spinda et al., 2016; Cushen et al., 2019). In future research, a comparative analysis of fan identity perceptions of similar but distinct items could be considered. Future study might also look into whether other more granular antecedents (e.g., event organizers, event participant experiences, crowd management, etc.) influence willingness to watch a game dependent on the type of event organization (Kirkup & Sutherland, 2017). By analyzing specific visitor motivations, marketing managers can develop targeted marketing communications, which are bound to have a positive effect on repeat visitor behavior. Based on the spending habits of eSports fans in various regions, it is even possible to develop personalized eSports tourism products.

The perception of fan identity is one of the focal points of POA-related studies, and we also discuss the behavioral differences between fans in two countries, China and Korea, in this paper. However, the fan identity might not be fixed. For instance, an eSports fan adores A player in team 1. He considers himself a "big fan" of A and watches as many Team 1 offline games as feasible. But when player A transfers to team 2, he will likely stop purchasing team 1 tickets or even home season tickets and commit to a fan of team 2. Of course, he might also have other choices. In general, however, we believe that followers' perceptions of their own identity and level of investment in maintaining that identity are unstable and influenced by numerous objective factors. Future studies may also be capable of utilizing more nuanced categorization and diverse analysis methods. "Nationality" is merely one of the identities of eSports fans. Additionally, "hometown pride" associated with teams, home games, leagues, and even regional teams and colleges may influence the consumption patterns of sports fans (Anderson & Fulton, 2008). In future studies, it may be more accurate to infer the spending patterns of gaming fans if two-dimensional or even multi-dimensional data are collected, and gamers are classified more precisely.

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Empirical Research Article

Metaverse Tourism: Elements and Consequences on Tourism Experience Journey

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Abstract

Prior research on Extended Reality (XR) has been a starting point for the development of the Metaverse. It is also a concern for researchers in the tourism field since it can enhance the tourist experience. Metaverse Tourism provides a virtual experience of the tourism destination for the users. It is potentially developed and predicted to be the future of tourism, enhancing the tourist experience through communication between humans and avatars and providing a new option for tourists to enjoy leisure activities. Recently, discussion on Metaverse tourism is still emerging, with some open talks from researchers in the intersections between information technology and tourism. This study extends prior studies by proposing six Metaverse tourism elements and categorizing them into core and supporting elements. Then, we analyze the consequences of those elements on the Tourism Experience Journey to enhance each stage with different characteristics. This study can contribute to continuing recent dialogues among scholars on how Metaverse can be applied in the tourism sector by proposing six elements that should be considered in developing and creating Metaverse services.

Keywords

extended reality; Metaverse Tourism; tourism experience journey; tourism services

1. Introduction

Metaverse has been starting to be very popular in the last ten years. The Avatar movie, released in 2009, introduced people to virtual technology and made it famous. The virtual realm is continuously developing by then. People can bring themselves to the virtual realm and interact with others as if they are in the real world. It is called Metaverse, a 3D virtual world that can give us a different experience in the virtual environment through immersive technology, such as Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). Recently, it has been attracting considerable attention both from academicians and practitioners. This effect is more prominent due to some restrictions in the COVID-19 pandemic. As a result, people are becoming familiar with virtual tours and increasing the acceptance and adoption of Metaverse in tourism (El-Said & Aziz, 2022).

Tourism as defined by United Nations World Tourism Organization (2008):

A social, cultural, and economic phenomenon entails people's movement to countries or places outside their usual environment for personal or business/professional purposes.

New Metaverse terms can be articulated into four typologies: AR, Lifelogging, Mirror worlds, and Virtual worlds (Smart et al., 2007) that can consist of a computing platform and avatars (Koo et al., 2022). In the 3D virtual world, Metaverse enables people to

interact with others like in the real world using customized Avatars (Koo et al., 2022; Um et al., 2022). Metaverse has changed physical reality in tourism and combined all requirements in a 3D realm that brings the virtual environment to the real world. It will transform the internet into a parallel virtual world and enhance physical locations in the virtual world (Buhalis & Karatay, 2022; Buhalis et al., 2023b). Meanwhile, AR brings virtual objects into the physical dimensions. For instance, AR can help augment reconstruction processes and navigation in tourist destinations (Cauchi & Scerri, 2019; Gherardini et al., 2018). Hence, Metaverse Tourism development should consider social, cultural, and economic growth that provides leisure activities.

In the early development of the virtual world, users could not engage actively due to technology limitations and a lack of user acceptance (Um et al., 2022). However, with the recent internet and technology development, users' approval has been higher in the last decade, allowing people to access the Metaverse freely, engage with other users, and embody real-world experiences. This experience is enriched by digital sensory stimuli (Petit et al., 2019; Santoso et al., 2022) that make people feel human senses: vision, auditory, touch/haptic, smell, and taste in the virtual world. Furthermore, digital human sense will increase human perception since exposure to digital sensory stimuli is vital to stimulate the virtual environment (Ranasinghe et al., 2018). In addition, the increasing sensory modalities and engagement in the virtual environment will enhance users' sense of telepresence (Dinh et al., 1999; Ranasinghe et al., 2018).

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In the future, Metaverse Tourism will not complement existing tourism (Musil & Pigel, 1994), but it will be another option for tourists to experience the destination. The creative industry and recent technologies, such as Blockchain and Non-Fungible Tokens (NFT), will enrich the existing service encounters. Therefore, Metaverse Tourism will affect the Tourism Experience Journey, starting from pre-travel, on-site, and post-travel.

This paper extends prior literature (Buhalis et al., 2023b; Dwivedi et al., 2022; Dwivedi et al., 2023; Koo et al., 2022) on the current debate and discussion on Metaverse, especially the utilization in the tourism sectors. Recent studies on immersive experience mainly discuss the effect of VR (Flavián et al., 2019; Tussyadiah et al., 2017; Tussyadiah, Wang, et al., 2018), AR (Jung et al., 2018; Tussyadiah, Jung, et al., 2018), and Mixed Reality (MR) (Debandi et al., 2018; Teo et al., 2019) in a silo approach. On the contrary, Metaverse Tourism talks about the device and expands to the new virtual ecosystem that can offer a new direction for people to enjoy tourism.

This study wants to provide a general idea of Metaverse Tourism and analyze the different properties of Metaverse Tourism that will enhance the Tourism Experience Journey. Extant research in Metaverse Tourism also overlooks how to design Metaverse Tourism to align with the Tourism Experience Journey. To fill the existing research gap, we conducted this study. A design perspective can help create a user-friendly technology that can trigger customers' willingness to adopt Metaverse as a new direction to enjoy tourist destinations. The design perspective in Metaverse Tourism can also facilitate the creation of technology-ready users that can help tourists engage with tourism destinations and organizations (Buhalis et al., 2023a). In addition, we will extend our discussion to understand the consequences of each phase of the tourism experience.

This study aims to answer the following question: ***What essential elements should be provided in Metaverse Tourism to enhance the Tourism Experience Journey? And what are the consequences of those elements to the Tourism Experience Journey?*** First, this study would like to structure a topic by identifying critical concepts from prior literature and establishing a foundation for Metaverse Tourism features. Then, by illustrating the key elements, we explain the existing research knowledge on Metaverse Tourism, including the utilization of VR, AR, and MR for tourism. From this framework, we also derive a research agenda for further exploration in service research that explicitly accounts for practitioners' demand for practical implications.

This paper is organized as follows. First, we review prior studies on XR in tourism to understand the basic concept of Metaverse Tourism and what has been done in information technology and tourism, including human-computer interaction. Then, following the difference between Smart Service and Metaverse, we present the Metaverse architecture and what researchers have done with this technology so far. Next, we categorized these properties into core and supporting elements for Metaverse. Finally, we explain the consequences of those elements on the tourists' experience journey and provide further research exploration in the service context, mainly in tourism.

2. Literature Review

2.1 Metaverse and Tourism Technology

Metaverse development in the tourism sector starts with prior studies in XR (Debandi et al., 2018; Flavián et al., 2019; Tussyadiah, Jung, et al., 2018; Tussyadiah, Wang, et al., 2018), which can transform visitors' experiences. Santoso et al. (2022) found that primarily VR, with its capability to create a fully immersive environment, can enhance the pre-travel experience

and increase tourists' intention toward the destination. In addition, VR can make sense of presence and brings enjoyment. Meanwhile, due to its ability to create interactive user interaction, AR is used during the on-site experience to overlay tourist information in a specific object. AR can help people learn about historical sites more interactively and intuitively. Finally, during the post-travel experience, prior studies mainly used VR to raise the memorability of tourists' on-site experience. As an outcome, it will increase the intention to revisit the destination.

As a 3D virtual realm, Metaverse can give tourists an experience economy (Jung et al., 2016) and provide the same sense as the real world. Metaverse in tourism offers an immersive environment and social interaction and embodies the experience of the real world. The virtual environment gives a transcendent space where people can express themselves through an avatar as an extended self (Belk et al., 2022; Belk, 2013). Metaverse's transcendental quality catalyzes other areas, such as tourism, marketing, and education, to perceive Metaverse as a new business model. Furthermore, it has extended the existing business model from a smart business and service into a metaverse business and service. In addition, it will also change the recent business models of tourism in the Metaverse (Greenwald, 2022).

Prior research on VR and AR for Tourism practices has yielded fruitful results. VR and AR have been adopted to enhance the tourist experience. Further, this kind of technology brings value co-creation practices to the tourism industry, collaborating with visitors on how VR and AR can be applied to create authentic experiences (Jung & tom Dieck, 2017). Metaverse tourism is beyond technology interfaces since it combines technology with ambient intelligence to bridge physical and virtual environments. It will create a holistic tourist experience from pre-travel, on-site, and post-travel. Gursoy et al. (2022) define Metaverse as:

The Metaverse is a collective, persistent, and interactive parallel reality created by synthesizing all virtual worlds to form a universe that individuals can seamlessly traverse. People can inhabit the Metaverse using digital avatars and experience the virtual world in multiple forms, including AR, VR, and MR.

Metaverse in the hospitality and tourism sector is still emerging, requiring further involvement from practitioners and researchers to determine the mechanism above those conceptual frameworks. In the hospitality and tourism industry, Gursoy et al. (2022) propose a concept of Metaverse in the tourism sector:

Metaverse applications are revolutionizing the hospitality and tourism industry as virtual hotels, destinations, and tours alter how people select lodging and destinations, make bookings, and even attend concerts. Although the metaverse cannot replace in-person travel, improvements in technology and sophistication in the quality of virtual reality (VR), headsets have made metaverse hospitality and tourism apps increasingly immersive

According to this proposed definition, Gursoy et al. (2022) emphasize how a novel virtual environment can attract tourists to enjoy the experience using VR headsets with fully immersive conditions and affordances. Metaverse Tourism offers tourists a chance to visit, connect, and enjoy the destination in the real and virtual worlds. For instance, a tourist can visit a virtual museum or virtual park in the virtual world, as shown in Figure 1 below. In this virtual environment, tourists can acknowledge entering a more substantive and immersive landscape and tourist attraction than ever before. Hence, this virtual environment can create a virtual experiencescape within the Tourist Experience Journey.

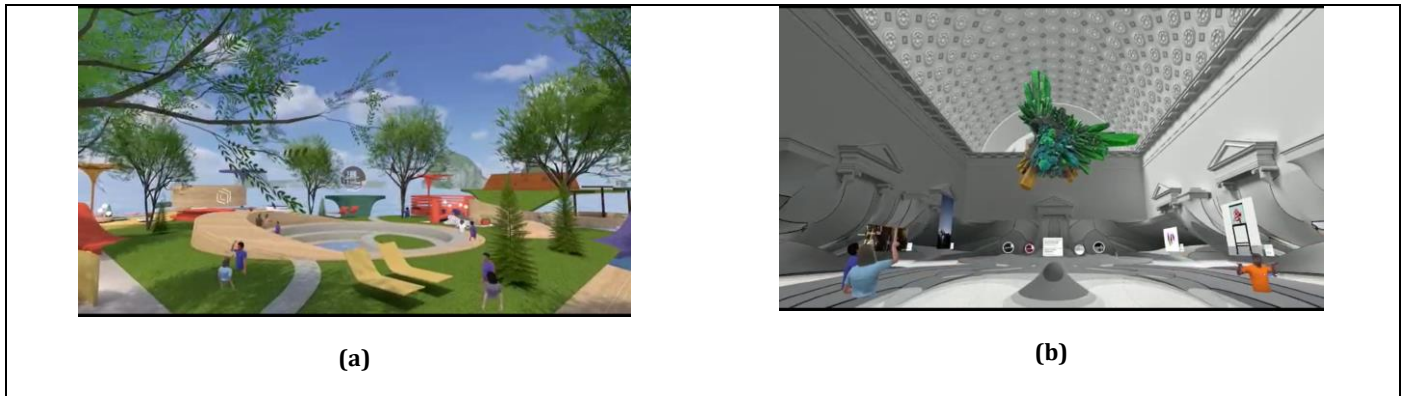


Fig. 1. Illustration of Metaverse Tourism in different virtual experiencescape: (a) Amusement park; (b) Museum

The development of Metaverse Tourism also enables the integration of some technologies to enhance the customer experience. However, the commercial and technological specifications vary because each entity that produces a virtual environment has access, membership, monetization, rights, and creative expression formats. For example, the development of Metaverse will open opportunities for integrating blockchain and Non-Fungible Tokens (NFT) to enhance the tourist experience. NFT, a type of cryptocurrency from Ethereum provides a creative direction to claim virtual/digital properties (Wang et al., 2021). Therefore, it might give tokenization of the entire experience journey and enable transparency and immutable characteristics for the tourist experience in Metaverse Tourism. Additionally, it will promote the growth of the creative economy by providing tourists with an authentic and unique experience that is different from the real-world tourist experience.

2.2 Metaverse Architecture

As mentioned in the previous section, to enhance the customer experience, Metaverse Tourism enables the integration of some technologies. Therefore, robust Metaverse architecture should be available and installed as an essential aspect of building Metaverse Tourism. Previous researchers have classified Metaverse architecture into several layers. For example, Jon Radoff proposed a seven-layered architecture of the Metaverse from bottom to top: infrastructure, human interface, decentralization, spatial computing, creator economy, discovery, and experience (Radoff, 2021). Architecture generally represents the industrial division. From the micro perspective, mainly in Metaverse Tourism, the Metaverse architecture, as illustrated in Figure 2, has three essential layers: infrastructure, interaction, and ecosystem (Duan et al., 2021).

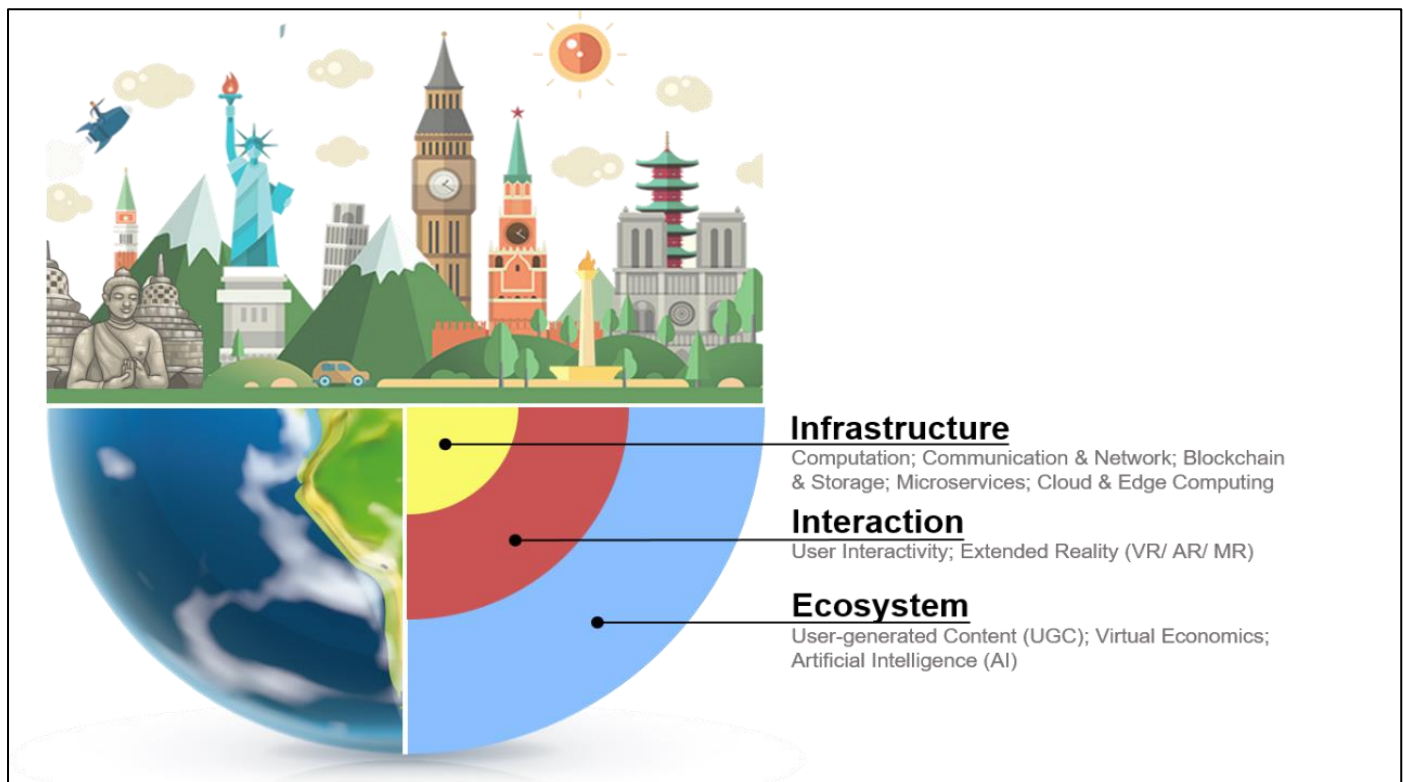


Fig. 2. Metaverse Layers (Adopted from Duan et al. (2021))

The infrastructure layer is the fundamental requirement for supporting the operation of a virtual world. This layer contains technology, enabling user devices (i.e., tourist destination

management) to connect to the network and deliver content related to the physical world. Computation, communication & network, and blockchain & storage are important technologies of

the infrastructure layer (Duan et al., 2021). Computation is required to develop a large-scale multimedia system for Metaverse Tourism. At the same time, communication and networking are essential to make Metaverse Tourism accessible at any time and place (Duan et al., 2021). For example, 5G communication technology is necessary to allow many people to live in the same space, requiring wide bandwidth for a stable network connection (Park & Kim, 2022). Because Metaverse Tourism is expected to connect everyone worldwide, an enormous amount of data would be generated and stored in mass storage.

Furthermore, blockchain technology must be introduced to support sustainable ecosystem operation in the Metaverse to guarantee decentralization and fairness. It enables value exchange between software, self-sovereign identity, and new ways of unbundling and bundling content and currencies. Microservices, cloud computing, and edge computing are essential for developing Metaverse in decentralization (Lee et al., 2021; Radoff, 2021).

The interaction layer is critical for bridging the physical (i.e., real tourist places) and virtual worlds (i.e., Metaverse world). Enhancing knowledge is the core idea of travel and tourism, which can be gained by interacting with the world (Lee et al., 2021). Therefore, the interaction layer must be considered to increase the customer experience journey. There are two components: user interactivity and Extended Reality (XR) (Lee et al., 2021). User interactivity is needed to receive data from the physical world so that users or tourists can control their avatars (as representation) to finish corresponding actions in the Metaverse world. For instance, location-based services provide parasocial interaction in the virtual world, as depicted in Figure 3(a). Multi-modalities of human senses are considered when choosing the user devices to build a customer experience journey, including

mobile, smart glasses, wearables, haptic, gesture, voice, and neural. Extended Reality (XR) is real-time 3D rendering-related technology, the primary interaction interface. XR encompasses AR, VR, and MR, in which all three “realities” share standard overlapping features and requirements, and each has different purposes, as mentioned in the earlier section. The parameters of physical devices can be collected by ubiquitous sensing technologies to maintain the same states as the corresponding digital twins. For reconstructing buildings, objects, and environments that exist in the tourist place, the 3D reconstruction approach is used to build realistic Metaverse Tourism (Duan et al., 2021; Navarro et al., 2017)

The ecosystem layer is a complementary element continuously required to serve users of Metaverse. This layer comprises user-generated content (UGC)/ content creation, creator/ virtual economics, and AI. The UGC is any form of content that users have created (i.e., Avatar) rather than the developers/operators of online platforms (Duan et al., 2021; Lee et al., 2021). Blockchain-based NFT provides a new approach to UGC in the Metaverse, certifying a digital asset as unique and not interchangeable. The virtual economy could offer rich content and a vibrant community in the Metaverse (Lee et al., 2021; Radoff, 2021). For instance, decentralized Finance, based on smart contracts and Fungible Token (FT), offers a way to innovate economic model transactions in Metaverse Tourism as depicted in Figure 3(b). AI-driven NPC is necessary to provide other computer-operated characters, such as enemies, partners, and support characters, with challenges, assistance, and help in the storyline of Metaverse Tourism. Social acceptability, security & privacy, and trust & accountability are supporting elements to develop a robust ecosystem of Metaverse (Lee et al., 2021).

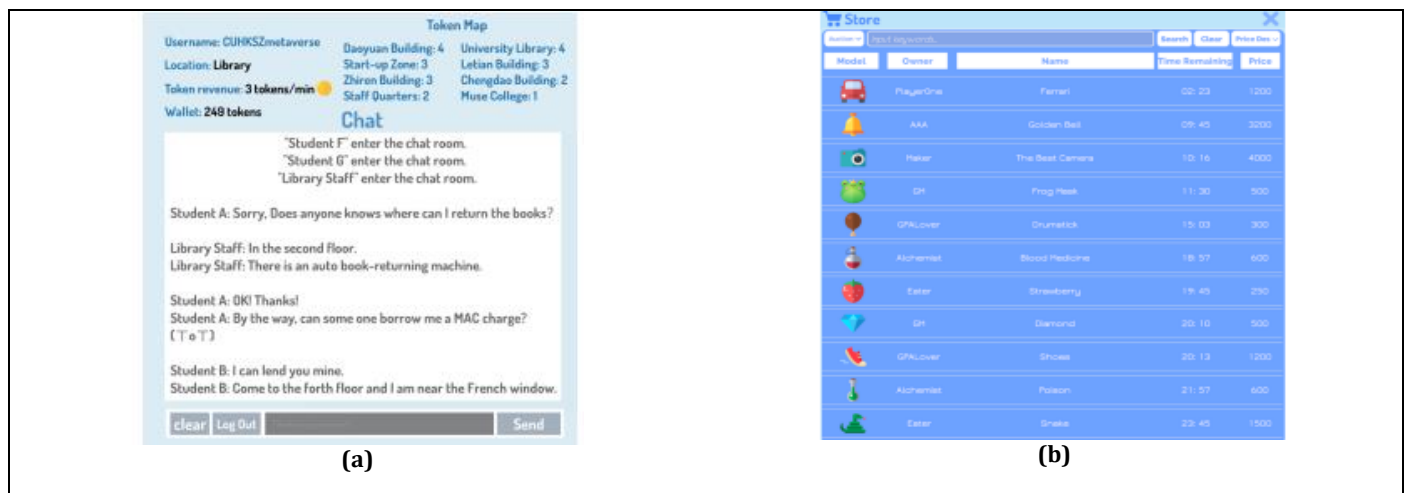


Fig. 3. Illustration of Metaverse architecture: (a) Location-based services in the interaction layer; (B) Trade and purchase services in ecosystem layer (Duan et al., 2021)

2.3 Overview of Tourism Experience Journey

Tourism experience is an accumulation of sequential steps the tourist follows, including pre-travel, on-site, and post-travel experience (Kim et al., 2012). As a result, tourists can gain memorable experiences, mainly from tourist perceptions and expectations (Kim et al., 2012; Larsen, 2007). The complexity of the Tourism Experience Journey can be seen through a holistic approach, ranging from anticipation during the pre-travel experience, going to the site, on-site experience, return from the site, and reflection on the post-travel experience. Therefore, tourists may have different experiences from the need for a vacation, planning the trip, interaction and participation on the site, and storing the experience (Godovykh & Tasci, 2020).

Volo (2009) defined experience as the reflection of energy from the environment, felt through human senses, processed, and categorized according to people's knowledge gained through time.

Consequently, the experience will be retained in people's memory under certain conditions. Therefore, during the on-site experience, tourists will feel four experiences: affective, cognitive, sensory, and conation (Godovykh & Tasci, 2020) by enjoying the experiencescape. Affective experience relates to tourists' feelings and emotional state during the experience (Godovykh & Tasci, 2020). Cognitive experience refers to cognition, thoughts, education, information, and intellectual, rational, knowledge of the experience (Verhoef et al., 2009). Sensory has a close relationship with the human senses and sensation gained from the human senses (Volo, 2021). Finally, conative is related to tourist behavior, involvement, act, and practice accumulated during the experience (Godovykh & Tasci, 2020; Kim et al., 2012). Tourists store their impressions and memories at the end of the experience, plan to revisit, and recommend destinations to friends (Kim et al., 2012; Park & Santos, 2017).

3. Elements of Metaverse Tourism

In the following section, we would like to identify the properties of Metaverse Tourism. We categorized those properties as core and supporting elements, as shown in Figure 4 below. We defined a core element as a collection of properties that the platform owner and system developer should provide to fulfill the customers' needs and expectations. Meanwhile, a supporting element is a set or series of properties related to the Metaverse that enhance customer experience and satisfaction with using Metaverse Tourism. We identify three properties as core elements: sensory modalities, accessibility, and interactivity. Meanwhile, the Metaverse Tourism supporting elements are amenities, activities, and usability.

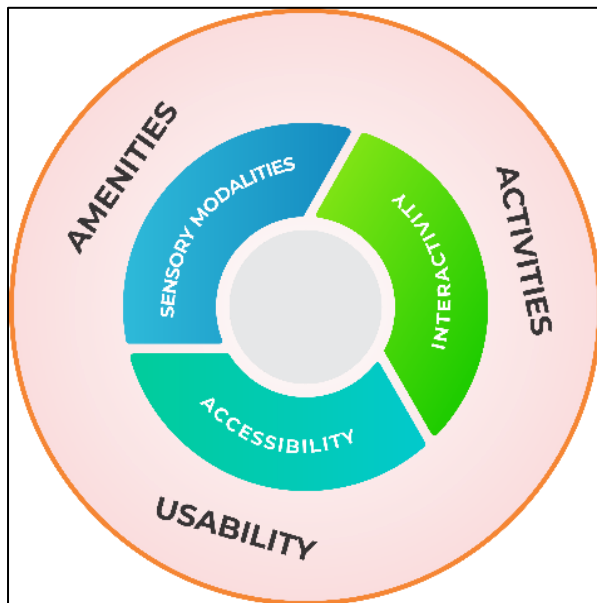


Fig. 4. Elements of Metaverse Tourism

3.1 Core Elements

3.1.1 Sensory Modalities

Enhancing the sensory modalities of tourists or users is one of the main elements for Metaverse Tourism to increase tourist experience, including user engagement, user perception, and sense of telepresence in a tourist destination. Digital sensory stimuli or multisensory technology is needed to accommodate this element (Petit et al., 2019; Santoso et al., 2022). Five human senses should be considered for building realistic Metaverse Tourism for tourists/ users, including visual, auditory, smell, taste, and haptic. XR is expected to be more seamlessly integrated into the tourism journey, enhancing tourists' interaction before, during, and after the trip. XR technology as an interaction layer can convey the perception of depth (for visual), which can replicate sight in physical environments (El Beheiry et al., 2019). It also offers sound spatial distribution (for auditory), which allows users to orient themselves and identify the directions of sound cues, a powerful medium for navigation and user attraction. Through motion controllers such as handheld input devices with a grip, buttons, triggers, and thumbsticks, tourists/ users can touch, grab, manipulate, and operate the virtual objects in Metaverse Tourism. In addition, haptic suits and gloves as wearables devices will also respond to haptic or touch (Maereg et al., 2017). Sensory modality streams (five human senses) are fused simultaneously in the game and can achieve remarkable realism, essential for impressive Metaverse Tourism. For instance, in thematic tourism such as port wine, tourists should expect to learn more by considering the five human senses in a virtual experience and significantly gain knowledge about port wine

history, the manufacturing process, and warehouse procedure (Martins et al., 2017).

3.1.2 Interactivity

As one of the most popular tourism technologies in recent years, customers expect metaverse interactivity. Park and Kim (2022) defined interactivity as a multifaceted concept that has been explored under three research streams. Referring to Fortin and Dholakia (2005), the first research stream focuses on the functional features of interactivity by identifying prominent interactive features. In addition, the second stream focused on interactive actions and processes that include information exchange and responsiveness (Bezjian-Avery et al., 1998; Liu & Shrum, 2002). Finally, the last study emphasized the perceived interactivity regarding timeliness and engagement (Chung & Zhao, 2004; Liu & Shrum, 2002; Park & Kim, 2022). In brief, interactivity exchanges information between users and advanced tourism technology through some features.

In Metaverse Tourism, tourists expect that they can have some interactive features as technological affordances. For instance, interactive control to actively control digital avatars to enjoy visiting the destination can be considered a core element in Metaverse Tourism. Tourists, represented by a unique avatar, move from one object to another, understand the destination's information, and enjoy the experiencescape in Metaverse Tourism. Furthermore, through an avatar, tourists can interact and communicate with other tourists, tour guides, and destination management. Although it is crucial, the concept of interactivity in Metaverse is slightly different from real-world interaction. Metaverse Tourism can provide engaging interaction and communication, enrich parasocial interaction, and provide discussion topics to help people interact in the virtual environment.

3.1.3 Accessibility

Accessibility is also the main element of Metaverse Tourism and is related to the layer of infrastructure and interaction. Communication and network are critical factors in developing ease of access for the tourist/ user, which can sign in from everywhere to the ecosystem of Metaverse Tourism. The server generates the room or platform as a virtual world where a multi-user can enter it. To provide multi or cross-platform, for instance, web, desktop, and mobile users in the same space, the domain server connects with users (i.e., tourist and tourist destination management) over Web Real-Time Communication (Web-RTC) and User Datagram Protocol simultaneously. The Metaverse is envisioned as a 3D Internet, or Web 3.0 (Mystakidis, 2022). It is a stimulating new method of interactive contact between users and microcomputer devices (i.e., iPhone, iPod, Palm, PC tables, etc.) where the contents of the interactive systems for tourists/ users are stored. Web 3.0 Metaverse worlds have traditionally been constructed on blockchain computing platforms. A wide range of parties contribute to producing games and in-game products freely sold on the blockchain. It promotes the integration of the virtual world with financial payment methods. A token-driven ecosystem is a crucial component of a modern metaverse since it leverages blockchain-based tokens to offer a fair and transparent ecology, which are monetary representations for the community (Tönnissen et al., 2020).

All users can claim tokens indefinitely using smart contracts, limiting the number of tokens people can collect at a specific time. The manufacturing rate of the receipt may vary for each user based on their activities and performance in both the virtual and actual worlds to increase UX, according to the set regulations. The tokens can be utilized in various activities, such as trading in an official store, trading UGCs with other players, and voting (Duan et al., 2021). Good accessibility when designing the user interface

(UI) can affect the user experience (UX). Users with disabilities or older adults are examples of potential users (Yusril, 2020) for Metaverse Tourism, so the designing platform or UI should consider the universal design. There are six universal design principles: fair use, flexible use, simplicity, tolerance for error, low physical effort, and size & space for approach and use (Begnum et al., 2019). In addition, accessibility should be well-managed, balancing with privacy and security issues of the Metaverse (Di Pietro & Cresci, 2021).

Metaverse tourism is a virtual experiencescape where tourists and other actors interact virtually. Applications like social networking will find it simpler to obtain legitimate data in the metaverse due to the implementation of blockchain technology. The blockchain's distributed ledger technology will allow acquiring actual data and records as transactions. Each block in a blockchain contains a cryptographic hash of the block before it, a timestamp, and metadata. Every action in a blockchain is recorded as a transaction.

Moreover, connectivity between virtual and physical systems can be a Metaverse ecosystem component. It requires two-way connectivity, enabling users to bring their preferred models to life while keeping them in synchronization with the actual world. The metaverse's apps cannot function correctly without an initial connection between the real and digital worlds (Huynh-The et al., 2023). Blockchain can facilitate the interconnectivity between the physical and virtual world, including data storage, data privacy, and data security concern (Huynh-The et al., 2023) that can trigger enjoyable experiences.

3.2 Supporting Elements

3.2.1 Usability

Jeon (2021) explained that usability is the pragmatic functional performance of a Metaverse platform and is measured by three items: the service's usability, convenience, and practicality. Related to Metaverse Tourism, usability is a supporting element the designer should provide. Potential users have high expectations of using the technology easily without difficulties operating the system. Metaverse technology should consider the wide range of users' demographic characteristics, such as age, education, and financial background. Therefore, it is expected that users with any demographic background can enjoy experiencescape in the Metaverse.

In addition, the Metaverse technology for tourism has to offer convenience for users. According to Jeon (2021), users' convenience is essential by providing some features well shown through user interfaces. In addition, to increase their convenience of experiencing the experiencescape, the UI design should consider any factors that can reduce pain and cyber-sickness. The system should accommodate the needs of targeted users regarding the user interface. Moreover, the practicality of the service is also critical, especially for those who are trying this technology for the first time. Users will commonly enjoy the journey while getting an authentic experience when entering Metaverse. In brief, usability leads to a good first impression from the user about the design of the tools, which are user-friendly and highly compatible.

3.2.2 Activities

Destination management should provide activities tourists enjoy during the trip. There has been a discussion from prior studies on enhancing tourism activities and its innovativeness in tourism (Chang & Gibson, 2011; Korres, 2008; Rid et al., 2014; Uysal et al., 2016). Consequently, tourism activities can increase the quality of life (Uysal et al., 2016) and subsequent tourism behavior (Chang & Gibson, 2011). In addition, it can increase tourism area competitiveness by providing innovation for tourism

activities (Korres, 2008). The connection between tourism activities and their consequences is embedded in the fully functioning tourism system. Therefore, tourism activities can benefit stakeholders, including destination management and tourists.

Gaining equal attention to real and virtual activities will be essential to achieving Metaverse Tourism's attractiveness and competitiveness. Moreover, we can create a different atmosphere for targeted tourists in the virtual environment. For example, we can offer street art activities to attract young adult travelers. Meanwhile, we can create a symphony orchestra to entertain older guests. With Metaverse Tourism, destination management can craft unique virtual offerings by providing a flexible service encounter and attraction, replacing the traditional perspective to see and enjoy the destination.

Moreover, the interactions in Metaverse Tourism can be enhanced by utilizing gamification. Gamification as a persuasive strategy to engage users through game-play mechanics to change the existing behavior (Hamari et al., 2014) can improve user relatedness and autonomy (Sailer et al., 2017). Prior studies use gamification for tourism and hospitality to promote and provide information during pre-travel experiences (on-site) (Bartoli et al., 2018). Combining activities with gamification might leverage tourists' psychological needs, evoke positive emotions, and increase destination loyalty. Therefore, blockchain technology in Metaverse Tourism can be a distinctive way to apply gamification in Metaverse Tourism compared to the real-world gamification process.

3.2.3 Amenities

Amenities are an important factor that plays an essential role in enhancing the user experience and improving customers' experience while using the facilities (Cobanoglu et al., 2011; Kim & Han, 2022). These studies stated that people would emphasize the general sense of well-being, reflecting the overall wellness and happiness of high satisfaction with life (Grzeskowiak & Sirgy, 2007). Prior researchers also consider amenities as one of the critical tourist criteria that affect tourist satisfaction and influence the decision to visit a destination (Han et al., 2018; Uysal et al., 2016). With amenities, tourists can have a leisure activity where tourists can relax and release their stress.

In Metaverse Tourism, amenities terms are similarly defined as leisure activity technology. The potential users of Metaverse Tourism expect an exclusive representation of their tourism object, supporting facilities, and surrounding environment. Therefore, the amenities should be well described. Amenities consist of facilities, services, and other features offered to the users. Facilities refer to the place and equipment provided for a particular purpose, while service is an intangible product that supplies the user's need. Related to the facilities, the designer and provider can offer any option hotels or villas, the nearest park, public areas or swimming pools, and additional accommodation such as a car or motorcycle to rent.

Moreover, the services that can be provided to the users include thematic and/or traditional clothes in the destination, local cultures like the people around commonly do, family photographs, and videos. These amenities can be aligned with the development of a creative economy in the interaction and ecosystem layers. Any particular creative actors and content creators can involve in enhancing tourists' experience. Further, it can reconnect and realign the physical and virtual dimensions of Metaverse Tourism. As a result, it can attract potential users and increases their interest. Additionally, it is expected to be a driver for future guests to decide whether they will visit the destination in the following days.

4. Consequences of Metaverse Tourism Elements to Tourism Experience Journey

Metaverse Tourism is distributed on the Tourism Experience Journey, starting from pre-travel, on-site, and post-travel experience (Koo et al., 2022). In the following section, we would

like to understand how these elements can be implemented at different stages of the Tourism Experience Journey and its consequences to experience. The interaction between Metaverse Tourism elements and their repercussions on the Tourism Experience Journey can be seen in Figure 5.

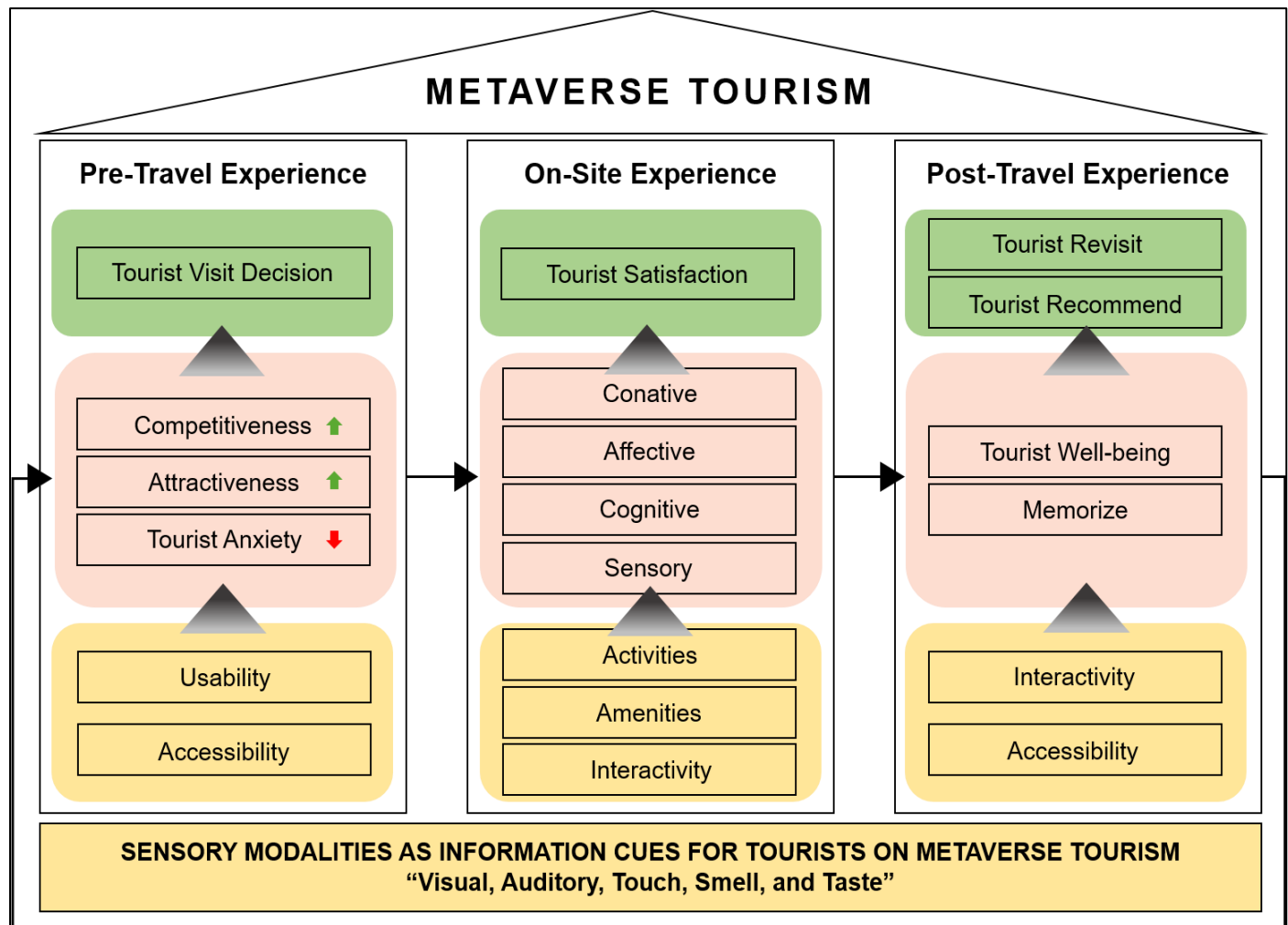


Fig. 5. Metaverse Tourism elements and tourism experience journey

Figure 5 illustrates how each element of Metaverse Tourism can be applied in each stage of the Tourism Experience Journey. We show two to three elements that dominate the design process of Metaverse Tourism. In addition, unmentioned elements do not mean we can ignore those elements in the designing process that influence tourist experiences. The yellow box indicates those pre-dominant elements in Tourism Experience Journeys.

Moreover, we also explain the consequences of pre-dominant elements in each stage on the tourist experience, as shown in the orange box. The consequences may increase some indicators and may loosen some negative indicators. For instance, in the pre-travel experience, good usability and accessibility might increase the competitiveness and attractiveness of Metaverse tourism and reduce tourist anxiety (such as worry about the experience). Lastly, we explain the outcome of each stage in the green box.

4.1 Pre-travel Experience Journey

As the core elements of Metaverse Tourism, sensory modalities can provide the tourist with some information. Sensory modalities can help tourists evaluate the destination by lowering anxiety and increasing relaxation and enjoyment (Villani et al., 2012; Vora et al., 2002). It might also influence the amount of

information delivered to tourists since information cues on Metaverse Tourism mainly come from sensory properties (Koo et al., 2022). Furthermore, sensory modalities can support two other elements: accessibility and usability. As included in the accessibility element, NFT and UGC can be distinctive ways to promote Metaverse Tourism for prospective tourists. Meanwhile, the Metaverse Tourism elements' usability might help form a first impression about the device and interface of Metaverse Tourism.

Implementing NFT and UGC on the Metaverse ecosystem layer can help destination management promote the destination. NFT and UGC-based promotion for Metaverse Tourism can offer exclusive tangible products or real-life services (Chohan & Paschen, 2021). For example, Sony Enterprise has done contemporary practice to promote "Goosebumps 2: Haunted Halloween" by offering blockchain-based trading cards (Williams et al., 2018). Consumers who have trading cards can receive rewards from the company. As a result, this marketing campaign can increase the movie's authenticity and gain much attention from the targeted audience. A similar practice can be done with destination management to promote Metaverse Tourism.

NFT and UGC can help to promote Metaverse Tourism by providing information to prospective tourists. Thus, tourists can gain information, process it into knowledge, and form perceptions. NFT, as a unique and legal UGC, usually contains two sensory

modalities, visual and sound. Sensory-enabled technologies (Petit et al., 2019) might increase the number of human senses that appeal to the NFT. Enriching the sensory properties of NFT might improve tourist perception of Metaverse Tourism and trigger mental imagery. It can also offer tourists more realistic content. As a result, it can increase tourists' immersive experiences. Tourists can handle the worry and anxiety that might appear in pre-travel experiences (Larsen, 2007). In addition, embedding other sensory properties in NFT can evoke emotions (Chohan & Paschen, 2021). Evoking emotions in the pre-travel experience will play an essential role in activating tourist motivations and inputs for visit decisions (Prayag et al., 2013). Consequently, it might provide an attractive and innovative direction to promote Metaverse Tourism. Furthermore, it can affect Metaverse Tourism's competitive advantage.

Accessibility also should be managed effectively and efficiently, integrating the Metaverse platform with other devices. Therefore, tourists can easily access different devices on the interaction layer (see Figure 2). Accessibility in real-world tourism can influence destination attractiveness and competitiveness (Kastenholz et al., 2012). A similar effect might appear in Metaverse Tourism. Providing an easy access and interoperability platform, supported by good usability, might influence Metaverse Tourism's attractiveness and competitive advantage.

4.2 On-site Experience

On-site experience, tourists gain different kinds of experience, including cognitive, affective, sensory, and conative (Godovykh & Tasci, 2020). In Metaverse Tourism, tourists should have a similar experience as in a real-world situation. One of the critical elements of Metaverse Tourism to create this similar experience is sensory modalities in the virtual world. Digital sensory stimuli that can provide digital human senses in the virtual environment are essential elements during the on-site experience. These stimuli can enhance the immersive experience and offer a sensory experience on Metaverse Tourism. In addition, providing sensory modalities can increase the sense of presence in the virtual environment (Ranasinghe et al., 2018).

Sensory modalities in the virtual environment also effectively deliver information and reduce the user's cognitive load in the virtual environment (Wickens, 2002). Most information cues in the virtual environment are provided to tourists through sensory cues. For example, the size of the virtual object can be delivered by using haptic technologies, providing access for tourists to explore digital things by touching them. As a result, it can offer a more realistic virtual environment to interact with other actors.

Moreover, sensory modalities might also influence tourists' affective experience by inducing emotions in the human sense. For example, Rantala et al. (2013) provided digital information cues of valence and arousal through digital touching. In addition, psychology and emotional states can be induced in customers through interaction with a 3D virtual environment and objects (Li et al., 2001). Instead of affective experiences, Tourists can get some information regarding the 3D virtual environment and the things surrounding it. Tourists process information gained from sensory information cues into knowledge. As a result, Tourists can have cognitive experiences.

As on-site experience mainly happens on the interaction layer of Metaverse Tourism, it needs interactivity elements of Metaverse Tourism. Tourists and other users of Metaverse Tourism are represented by digital avatars, creating possibilities to communicate and enhance parasocial interaction. Avatars can visualize users' genders, physiques, outfits, gestures, and other characteristics as visual cues from tourists and other stakeholders. Furthermore, Avatar can be controlled by a human or an intelligent agent, called Non-Player Character (NPC). Realistic NPC is an essential component of the virtual environment that should have humanlike behavior (Lee, 2007). Prior studies found that

NPC will affect users' emotional responses and increase the sense of telepresence (Lee, 2007). In Metaverse Tourism, providing NPC might be indispensable in enhancing affective and conative experiences. Consequently, it will provide a more engaging and authentic experience in the virtual environment.

Activities elements should support metaverse Tourism to enhance the interaction in the virtual environment. Attractive and innovative activities, combined with gamification mechanisms, can help tourists have more engaging activities. Furthermore, metaverse Tourism should provide flexible activities based on tourists' demographic characteristics and preferences. Moreover, Metaverse Tourism will support the development of the creative economy ecosystem. Therefore, enriching the on-site experience by providing additional amenities aligns with developing the creative economy ecosystem in the metaverse environment, supported by blockchain technology. For example, tourists might have different clothes to be used, combining virtual environments with digital clothing technologies. Another example, tourists might have digital assets in Metaverse Tourism that can be bought and sold through trade and purchase services in the ecosystem layer (see Figure 3(b)). Combining interactivity, amenities, and activities might help increase tourist satisfaction and memorable experiences.

4.3 Post-travel Experience

During the post-travel experience, tourists remember the experience and have a post-travel reflection. To recognize and memorize the experience, tourists need stimuli. Therefore, Metaverse Tourism should provide sensory stimuli. NFT, as included in the accessibility elements, can be an innovative technology to collect the tourist experience. NFT is embedded with timestamps and can describe a unique experience on a particular date. Therefore, NFT can save and memorize memorable tourist experiences from pre-travel to on-site experiences. In addition, NFT, enhanced by sensory modalities, can be a stimulus to recall unique memories about the activities (Brady et al., 2011).

NFT can stimulate mental imagery by offering visual stimuli to raise perceptual reenactment of previous experiences. Furthermore, providing visual stimuli through NFT can trigger the process of visual information that holds information and manipulates it to perform cognitive tasks. As one of the core elements of Metaverse Tourism, sensory modalities can enrich tourists' information about pre-travel and on-site experiences. For example, the smell of coffee can help tourists remember the museum experience since it plays an essential role in the setting of a museum or art gallery (Spence, 2020). Consequently, it can increase tourists' intention to revisit since tourists expect to gain similar experiences with the prior ones.

A tourist might reflect on the effect of Metaverse Tourism on well-being, both hedonic and eudaimonic. Therefore, NFT might help tourists to remember the existing experience. Furthermore, extended reality as a part of the interaction layer on Metaverse Tourism might help to provide rich visual stimuli by providing an immersive environment. Thus, it can make tourists memorize cognitively and affectively (Xi et al., 2021). In addition, NFT also can help to promote Metaverse to other tourists. Combined with interactivity elements, it can be a creative direction to promote the destination by recommending it to other tourists. In addition, tourists can sell their NFT to others, provoking others to visit the destination.

5. Conclusions

Recently, the technological advancements of XR have been an excellent start to understanding the implication and practical issues of the virtual environment. With the emergence of Metaverse, it could be a new direction to enter a new era to bridge

the physical and virtual environment. Excellent and deep knowledge of Metaverse can be a solution to create a completely holistic and digital experience. This paper provides core and supporting elements that can be considered in designing and developing Metaverse Tourism. We propose three core and three supporting elements that service designers can be regarded as while developing Metaverse tourism. We extend our concept on how to apply these elements to a specific Tourism Experience Journey stage. Metaverse will be a critical solution for the hospitality and tourism industry to serve customers better, keeping would-be customers interested. At the same time, Metaverse Tourism will be an option for the hospitality and tourism industry to raise and recover from the impact of the COVID-19 pandemic.

Although the conceptual background of Metaverse tourism is still infancy, this paper tries to extend recent discussions and debates on the utilization of this emerging technology. Proposing an excellent and deep knowledge of Metaverse can be a solution to create a completely holistic and digital experience. In the tourism sector, Metaverse can be a new direction for tourists to enjoy fun and pleasurable moments with the virtual environment and objects. Further, Metaverse tourism can be an alternative to promote cities, locations, and events to other tourists and actors. Metaverse can be combined with other technologies to enrich tourists' experience and understand users' behavior, including blockchain, AI, and digital clothing.

But, the development of the virtual environment has been entering a new era by introducing Metaverse to capture a virtual world and extend the physical reality. Excellent and deep knowledge of Metaverse can be a solution to create a completely holistic and digital experience. In Tourism, Metaverse will be an option for leisure activities, creating possibilities to build Metaverse Tourism. Metaverse Tourism will develop new ways to promote cities, locations, and events to other tourists and actors. As the device interacts in the virtual environment, XR can get more accustomed to this technology. Moreover, Metaverse can be combined with other technologies, such as blockchain and digital clothing, to enhance the tourist experience.

5.1 Limitation and Future Research Direction

This paper provides conceptual background to analyze six properties of Metaverse Tourism. To discuss the limitation of the article, we discuss it based on Metaverse architecture, mainly focusing on the interaction and ecosystem layer. In the ecosystem layer, The successful introduction of Metaverse Tourism might depend on the value created for tourists and platform owners. It might also destroy the existing value of tourism practices. Although it is important, prior studies have not discovered this phenomenon. Therefore, it might be beneficial for service researchers to understand the value of co-creation and co-destruction of Metaverse Tourism to the existing tourism practices (Akaka & Vargo, 2014). Metaverse Tourism might develop a new tourism business model in the ecosystem layer of metaverse architecture, providing a new service to tourists. Therefore, future studies can understand the suitable business model for Metaverse Tourism to deliver the service. Furthermore, future research can understand how to manage and govern the creative economy in Metaverse Tourism and how this ecosystem can grow with innovative capabilities from its network actors. The ecosystem's generativity might be suitable for understanding the mechanism elaborating future studies for ecosystem platforms in the service era (Thomas & Tee, 2022).

The second part of the limitation is on the interaction layer. This study does not consider virtual loneliness in the virtual environment. Since XR brings tourists to a new and immersive environment, it might affect tourists' interpersonal. Feeling lonely motivates people to interact and communicate with others. In addition, it can trigger subsequent behavior and cognitions to reinforce their loneliness. Although it often appears in the virtual

environment, people might feel more lonely in the real world than in the virtual environment (Martončík & Lokša, 2016). Tourism as a means to escape from daily routines should combat loneliness. Therefore, Metaverse Tourism should also consider loneliness to provide a reasonable quantity and quality of social interactions. Therefore, we need future research to understand the effect of Metaverse Tourism on tourist loneliness. Can interaction and communication in the virtual environment lower the degree of tourists' loneliness? In addition, can NPC help boost this interaction and communication in the virtual environment?

Service failure and recovery can also be important issues for further exploration, which are not discussed in this paper. As the hospitality and tourism industry is characterized as a "people business" (Kim et al., 2010), it might be essential to understand the underlying mechanism of service failure and how to handle it in Metaverse Tourism. For example, tourists might attach significantly more value not to losing than winning. Consequently, it might raise negative feelings after a service failure much stronger. Furthermore, Metaverse Tourism is a unique environment for service recovery since it has no direct interaction. Therefore, it might be beneficial to understand the mechanism of service failure and recovery in the virtual environment. For example, how many tourists experience failure in the virtual environment, and what emotions might appear in this situation? Does it affect other tourists? What kind of interaction and mode of communication should be conducted to enhance parasocial interaction and effectively handle failure in the virtual environment?

5.2 Theoretical Contribution

This study extends current discussions on the application of Metaverse in the business contexts (Ahn et al., 2022; Buhalis et al., 2023b; Dwivedi et al., 2022; Dwivedi et al., 2023; Giang Barrera & Shah, 2023; Koo et al., 2022). In this conceptual paper, we bring some design and user interface components in developing Metaverse tourism with some considerations on three layers of Metaverse architectures. XR technology mainly happens on the interaction layers of the Metaverse universe. Therefore, this study tries to broaden the discussion by analyzing the underlying elements and how they can be applied to different stages of the Tourism Experience Journey. As a result, these elements might be beneficial for tourists in receiving fun, authentic, and enjoyable experiences in Metaverse tourism.

5.3 Practical Contribution

This study also contributes practically by offering the elements of Metaverse Tourism that platform owners should consider. The identified core and supporting elements can guide the Metaverse Tourism design. As a result, it can maximize tourism experiences and enjoyment. Second, this study extends prior studies on the holistic approach to tourist experiences in the 3D virtual world (Santoso et al., 2022). In addition, this study provides some key features to enhance tourist experiences in Metaverse Tourism that might be useful. On the other hand, destination management can understand what should be provided for Metaverse Tourism and the consequences of those elements.

Declaration of competing interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Empirical Research Article

Getting Smart? A Research Note into Smart Tourism Curriculum and Implications on Generation Alpha and Beta

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Abstract

This research note probes the largely ignored sphere of smart tourism curriculum as destinations and institutions seek to develop graduates ready to embrace the demands and challenges of future work environments where technology has a ubiquitous presence. This knowledge gap is somewhat surprising, even as destinations progress towards smart tourism futures, without necessarily clarifying what human resources need to possess in the coming decades. Drawing from available smart tourism curriculum across the globe, and emergent trends associated with Generation Alpha and Beta, this research note paints a timely picture of how smart tourism curriculum should be designed and developed to meet the needs of industry and consumer demands and expectations.

Keywords

smart tourism education; future workforce; smart human resource management

1. Introduction

The term smart tourism encapsulates a technologically mediated and symbiotic environment with humans to derive evidence-based knowledge to guide decision-making within tourism (Gretzel et al., 2015). Its popularity as witnessed in an emerging body of tourism literature can be attributed to a combination of technological advances, and consumer trends to adopt and interact with such tools across a range of platforms, such as websites, social media, artificial intelligence, and big data (Ardito et al., 2019). From a supply-side perspective, smart tourism requires a smart Destination Management Organisation (DMO) leadership, whereby it necessitates the DMO to be collaborative, adaptive and value-creating (Gretzel, 2022). Destinations seek to embrace smart tourism capabilities to reduce inefficiencies and to develop competitive advantages over other destinations (Kontogianni & Alepis, 2020). It is for this reason that current literature has sought to unpack smart tourism across a range of destinations, tools, and benefits to both destinations, the tourism industry, and its consumers (inter alia Gelter et al., 2021; Otowicz et al., 2022).

However, despite its merits, smart tourism detractors point to the increasing alienation between traditional offerings of tourism to feature human-to-human interactions and overshadowed or replaced with machines or other technologies to raise ethical concerns (Chen et al., 2022; Femenia-Serra et al., 2022). Smart tourism affordances have also been scrutinized, as it pits destinations against one another, where those who have access to, and leverage on such opportunities are generally far more advanced along the continuum of “smartness” as compared to

others that may be less endowed with smart tourism infrastructure or financial might (Borges-Tiago et al., 2022; Wang et al., 2022). Scholars argue that smart tourism merely exacerbates the digital divide, which is already evident in the case of virtual tools accompanying destinations over the course of the COVID-19 pandemic (Law et al., 2022; Sun et al., 2022).

Another glaring omission from smart tourism literature is perhaps what constitutes a smart tourism curriculum, or what Gretzel (2021) argues as the smart tourism mindset, especially when more and more university graduates enter the workforce of the future. It is also a timely conversation to have, as the next two age segments - Generation Alpha (those born between 2010 and 2024), and Generation Beta (those born between 2025-2039), will feature in the smart tourism landscapes of 2050 and beyond. Therefore, drawing from available smart tourism curriculum across the globe, and emergent trends associated with Generation Alpha and Beta, this research note paints a timely picture of how smart tourism curriculum should be designed and developed to meet the needs of industry and consumer demands and expectations.

2. Characteristics of Generation Alpha and Beta

Generation Alpha and Beta are classified as those born between 2010-2024, and 2025-2039 respectively, according to McCrindle Research (2020). As some of these individuals are yet to be born, it is unsurprising that there is a dearth of academic literature to paint a nuanced insight into what the future is like for such generations. Nevertheless, Smith (2021) postulated that the

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future of higher education will need to leverage technological capabilities and social presence principles to support student learning trajectories, and design assessments that reflect the future of work. However, Smith's (2021) propositions remain focused on the technical aspects of smart/digital tourism futures, and not necessarily the human-machine interaction *in-situ*. For this reason, a range of grey literature (e.g., websites, books, and industry reports) are sourced to examine how Generation Alpha and Beta are likely to embed themselves within smart tourism environments, and how current developments should also be aligned with their needs.

Generation Alpha - many of whom are already completing their primary education, are very much comfortable with having technology surrounding their everyday life, and perhaps the first generation where almost everything operates on-demand - movies, food, music, transport, accommodation etc (Pinsker, 2020). It is for these characteristics that market research predicts and pays close attention to consumer trends of Generation Alpha, urging brands and companies to connect with these individuals and win them over based on moral and emotional ties, rather than purely functional attributes of products and services (Gaid, 2023; Ryan, 2023). In contrast to Generation Alpha, Generation Beta is instead characterized by four attributes - blurred work-life boundaries, rapidly evolving mindsets, highly technologically saturated, and demonstrates elevated levels of activism (Smith, 2020). Indicative evidence suggests that both generations are likely to be comfortable in employing technology, and in co-creating knowledge and solutions in a socially constructed manner (Cauchefier, 2022; Tigar, 2022). Crucially, Generation Alpha and Beta workforce want greater autonomy and purpose in their employment, and pushing their own boundaries (Schawbel, 2020).

Despite interesting differentiating characteristics of Generation Alpha and Generation Beta, both generations share similar challenges. Market research indicates that while they are generally more formally educated, both generations are less adept at establishing hands-on competencies, assessing risk, planning and completing goals, and other practical skills (McCrindle Research, 2020). Additionally, both generations are thought to experience higher levels of anxiety and stress. Various studies have reported a direct relationship between overexposure to technological devices and the negative mental well-being of individuals. While information communication technologies (ICTs) have significantly improved work processes and information sharing, studies show how such information overload can cause harmful effects on the growth of children. And in this case, the children of Generation Alpha and Generation Beta will not only have a more sensitive mental well-being but also experience a shorter attention span. This begs the question as to how future smart tourism tertiary education can better support both generations and seek to educate them with the necessary skills and knowledge.

As such, knowing about Generation Alpha and Beta alludes to how these individuals learn and acquire knowledge. What will be more important is how they behave/operate in the workforce, and more importantly, for this research note, in a smart tourism environment.

3. Smart Tourism Curriculum

In this research note, a smart tourism curriculum is broadly defined as higher educational courses that address smart tourism objectives both in terms of technical capabilities, and other soft skills such as problem-solving and working alongside robots for instance. As Boes et al. (2016) highlight, smart tourism requires destinations to possess "hard smartness" and "soft smartness." While "hard smartness" refers to the technological infrastructure and data capabilities of a destination which leads to the (co-)creation of value, "soft smartness" emphasizes the human aspect, i.e. social capital (collaboration) and human capital

(knowledge and skills) (Boes et al., 2016). Therefore, smart tourism curriculum should reflect these industry requirements to ensure the future workforce of smart tourism possesses the necessary skills and knowledge. Despite the vast literature on smart tourism destination development and management, there is a lacuna of papers other than the work of Femenia-Serra (2018) that explores the higher education landscapes of smart tourism. This is somewhat surprising, as smart tourism is not intended to displace the human factor within the industry, but instead, co-exist and leverage human-technological capabilities towards desired outcomes. For this reason, it is important to take stock of what currently exists, at least in the English-speaking domain, of what constitutes smart tourism curriculum - similarities, strengths, and areas of improvement.

4. Methods

To gain a snapshot of smart tourism curriculum available in the public domain, a Google search of smart tourism course/subject outlines was undertaken in early March 2023. The search process identified 16 smart tourism courses, of which 6 did not have specific content over the semester. Nonetheless, the remaining 10 courses are analyzed for their nomenclature and a summary of these is presented in Table 1.

5. Results and Discussion

Based on the results of the Google search, the results of the smart tourism curriculum are presented in Table 1. From Table 1, a key observation is that smart tourism curriculum is located in just three continents - Europe (6 institutions), Asia (3 institutions) and North America (1 US institution). This perhaps suggests that smart tourism in higher education is very much in its infancy, or that there are barriers to incorporating smart tourism domain knowledge within universities, such as a lack of faculty expertise, or costs of accessing big data for example. Nonetheless, smart tourism curriculum across the ten institutions is mostly concerned with introducing the landscape of smart destinations, tourists and the management of such developments, and correspondingly, designing smart tourism experiences and elucidating methods associated with smart tourism research projects. Less than half of the curriculum reflects ethical issues with smart tourism, sustainability, or marketing-related foci.

Table 1. Scope of smart tourism relevant courses within selected universities

Institution	Smart Tourism Destinations (Including Field Trips)	Innovation and Technology, Experience Design	Smart Planning/Research Methodology	Digital Marketing	Communication in Digital Tourism	Corporate Responsibility and Public Rights	Apps and Social Networks (Big Data & IoT)	Energy Management	Climate and Environmental Risks	Smart Tourism Infrastructure
University of Nebrija	✓	✓	✓	✓						
Universitat de les Illes Balears			✓		✓	✓	✓	✓	✓	✓
Universitat de Barcelona	✓		✓			✓				
Vidzeme University of Applied Sciences	✓	✓							✓	✓
Gingko College of Hospitality Management	✓	✓	✓	✓						✓
Munich University of Applied Sciences	✓	✓	✓			✓	✓			
University of North Texas	✓	✓	✓		✓	✓	✓			
Macau University of Science and Technology	✓	✓	✓	✓			✓			
Yeditepe University	✓	✓			✓	✓	✓	✓	✓	✓
Macau Institute for Tourism Studies	✓			✓			✓		✓	

However, Table 1 also reveals what smart tourism curriculum, at present, does not possess. For instance, key domains such as human resource and finance are conspicuously absent in Table 1. These key aspects of any organization need to be in the future curriculum as they are fundamental to address under-investigated issues such as:

- What skill sets are needed for individuals to work within smart tourism ecosystems?
- How do we prepare graduates to work with robots, Artificial Intelligence within an Internet-of-Things landscape?
- In what ways can we undertake a cost-benefit analysis in employing smart tourism?
- Can small and medium enterprises build smart tourism capabilities within their limited resources and finances?

Next, this research note will discuss the implications of Generation Alpha and Beta, and how to overlay smart tourism in order to leverage the potential of this future workforce.

The implications of this research note reveal that more needs to be done to prepare students for smart tourism careers, building on what Table 1 has revealed in terms of higher education curriculum in smart tourism. In addition, a glimpse into the futures of Generation Alpha and Beta warrants an introspection into how smart tourism environments are formulated that give greater control to such individuals, even though it may appear that smart tourism operates in a (less/un)moderated manner. Then, from an organizational perspective, determining what to place in a job advertisement, such as this one from Dublin needs to be carefully articulated. This would prompt how we consider strategic human (and machine) resource management, especially when the jobs of 2050 would be filled by more than 2 billion individuals from Generation Alpha and Beta, as Wallace (2022) estimates.

Additionally, smart tourism curriculum should consider more effort to develop greater critical thinking and hands-on competencies. As Generation Alpha and Generation Beta have grown up with digitalization all around, teaching content should incorporate practical skills such as programming and risk assessment. Curriculum assessment on the other hand should aim to develop students' "soft smartness" skills such as planning and goal completion, collaboration and communication (Boes et al., 2016).

Furthermore, although the overview of the smart tourism curriculum provides an interesting snapshot of the content taught for smart tourism, little is known about the delivery of content. As highlighted before, the smart tourism curriculum content must meet the needs of the tourism sector. Meanwhile, the delivery of the smart tourism curriculum must meet the needs of Generation Alpha and Generation Beta students. Market insights indicate how both generations experience higher levels of anxiety and stress while also demonstrating a far shorter attention span (McCordle Research, 2020). Studies suggest blended learning of digital and face-to-face learning which incorporates elements of creativity and innovation could be considered to introduce an element of fun and help students to better focus (Ziatdinov & Cilliers, 2021). As such, a more visual, engaging and multimodal approach should be used in smart tourism curriculum for future technology-driven generations.

Additionally, a practical example of effective delivery is the use of the "whole-to-parts" approach when teaching Generation Alpha and Generation Beta. Smart tourism is embedded in a complex network of stakeholders, interconnected with technological devices. Balancing such a complex ecosystem may be confusing for a generation that is considered to be lacking in understanding risk and goal completion. In the "whole-to-parts" approach, students are exposed to the overall ecosystem before delving into the subject matter (Akasah & Alias, 2010). A clear map is made to present the interconnectedness between each component and curriculum of smart tourism. This approach has

been applied in teaching complex systems in the engineering field (Akasah & Alias, 2010). Considering the multi-layers of technology and human interaction in smart tourism, the "whole-to-parts" approach could also be incorporated in teaching smart systems in tourism. An approach that is thought to simplify the learning of complex systems and ultimately help support Generation Alpha and Generation Beta in their smart tourism education.

6. Conclusion, Limitations, and Future Studies

In conclusion, the topic area of how smart tourism curriculum can be designed for the needs of the future tourism workforce i.e. Generation Alpha and Generation Beta are limited. Therefore, this research note sought to understand how smart tourism curriculum should be designed and developed to meet the needs of industry and consumer demands and expectations. Smart tourism capabilities are important to enhance destination efficiencies and develop advantages over other destinations. Elements such as technological infrastructure should be developed alongside the human and social capital of smart tourism destinations. An overview of the existing smart tourism curriculum suggests that more needs to be done to prepare students for smart tourism careers. For instance, while most smart tourism curriculum focus on the general management and design of smart tourism experiences, there is far less emphasis on the ethical, financial and sustainability issues of smart tourism. Reflecting on the projected characteristics of Generation Alpha and Beta, future smart tourism curriculum should also focus on the development of practical (e.g., programming and risk assessing) and personal (goal completion, collaboration and communication) skills.

This research note presents an initial understanding of the smart tourism curriculum landscape. While it presents an overview of the content taught related to smart tourism in tertiary education, it omits the delivery approach. Delivery of knowledge based on the personalities and characteristics of students is crucial to ensure students are more receptive to new knowledge. This research note suggests the use of gamification and the "whole-to-parts" approach in delivering smart tourism curriculum to Generation Alpha and Generation Beta. Nonetheless, a deeper analysis is required to examine whether the current delivery methods meet the psychological requirements of Generation Alpha and Generation Beta. Future research should explore the delivery methods of smart tourism that would be most effective towards Generation Alpha and Generation Beta. Furthermore, this research note assumes that these Generations may even decide to pursue formal tertiary education. Current trends of accessible and customizable online courses may gain traction amongst future generations. Therefore, future research could examine how smart tourism education could be strategized to become more adaptive and flexible to meet the mobile needs of Generation Alpha and Generation Beta.

Declaration of competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this research note.

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Empirical Research Article

Over the Rainbow: How to Fly over with ChatGPT in Tourism

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Abstract

Tourism and hospitality have encountered significant changes in recent years as a result of the rapid development of information technology (IT). Customers now expect more expedient services and customized travel experiences, which has intensified competition among service providers. To meet these demands, businesses have adopted sophisticated IT applications such as ChatGPT, which enables real-time interaction with consumers and provides recommendations based on their preferences. This paper focuses on the AI support-prompt middleware system, which functions as a mediator between generative AI and human users, and discusses two operational rules associated with it. The first rule is the Information Processing Rule, which requires the middleware system to determine appropriate responses based on the context of the conversation using techniques for natural language processing. The second rule is the Information Presentation Rule, which requires the middleware system to choose an appropriate language style and conversational attitude based on the gravity of the topic or the conversational context. These rules are essential for guaranteeing that the middleware system can fathom user intent and respond appropriately in various conversational contexts. This study contributes to the planning and analysis of service design by deriving design rules for middleware systems to incorporate artificial intelligence into tourism services. By comprehending the operation of AI support-prompt middleware systems, service providers can design more effective and efficient AI-driven tourism services, thereby improving the customer experience and obtaining a market advantage.

Keywords

ChatGPT; artificial intelligence; AI middleware; service application design

1. Introduction

The tourism and hospitality businesses are expanding with greater dynamism and different business models due to the rapid development of information technology (IT) (Buhalis & Cheng, 2020). The level of service that customers expect and how it is delivered have changed, and tourism service providers are entering a new level of competition by adopting cutting-edge IT applications. Customers expect more convenient services and want a distinctive travel experience. Companies in the tourism and hospitality industry strive to utilize information services to increase customer satisfaction and eventually gain a high level of loyalty (Buhalis & Cheng, 2020). Utilizing IT applications to provide richer information about tourist destinations and respond to customers' real-time needs is linked to positive revenue streams (Ukpabi et al., 2019).

On the one hand, rapid access, automation, and usability have made the smart tourism applications indispensable. Beyond automation-related aspects, however, there is a demand for personalization. Many Artificial Intelligence (AI)-based solutions (such as chatbots) are gaining market share for this purpose (Arteaga et al., 2019). A chatbot is an information technology artifact that is devised to hold a conversation with a human using natural language and symbols. In the 1960s, Joseph Weizenbaum created ELIZA (Weizenbaum, 1966), the forerunner of contemporary chatbots. The purpose was to emulate a psychotherapist with limited knowledge and multiple

workarounds to avoid conversational dead ends. Although more than fifty years have elapsed since the conception of this groundbreaking concept, chatbot services have only lately matured to the point where they may be widely deployed and utilized in a variety of real-world circumstances. Nowadays, chatbots are designed to comprehend one or more human languages with Natural Language Processing (NLP) using knowledge repositories consisting of a set of dialogue management rules that employ various ways for processing the user's input (Ukpabi et al., 2019).

In many advanced chatbots for smart tourism, ChatGPT (<https://chat.openai.com>) is the world's most advanced chatbot in existence so far. ChatGPT is fascinating because it is not just designed to talk to humans, but has evolved to the point where it can discover knowledge, provide information, and solve problems with humans. Considering that tourism activities are characterized by the active consumption and production of information and knowledge, it is not difficult to imagine that various service applications based on ChatGPT will be actively developed.

2. Background

2.1. Chatbot

A chatbot is regarded as a model of technology application

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that efficiently facilitates interpersonal contact and learning, as they provide different kinds of information and knowledge in an interactive manner and user-friendly interface (Anthony et al., 2008; Muniasamy & Alasiry, 2020). With the proliferation of mobile devices and mobile apps, there is more and more location-based data for chatbots to learn from, which means we can expect to see more and more chatbots used for tourism purposes. Chatbots are useful in information distribution and learning areas, such as helping users learn in an entertaining manner through real-time interaction (Hwang & Chang, 2021) or enhancing communication skills among the same group of individuals (Hill et al., 2015).

Chatbots are information technology artifacts that provide service values, such as informing or entertaining, through conversation (Brennan, 2006). Early chatbots analyzed user input and used keyword matching or natural language processing algorithms to come up with simple responses in a prepared format (e.g., Brennan, 2006; Weizenbaum, 1966). Due to the increase in computing power, advances in big data technology, technological advances in various mobile devices, and technological advances in artificial intelligence speech recognition, chatbots have evolved from a text format to enable voice conversations (Guttormsen et al., 2011). For example, Apple offers a voice-activated assistant called Siri. By utilizing voice, text, and other multimedia means, Siri is designed to meet the information needs of users on a day-to-day basis. Amazon's Echo and other artificial intelligence speakers are also designed to utilize a voice interface to interact with users and fulfill their information needs. Those AI speakers are technically similar to the voice chatbots offered by Apple, Google, Samsung, and others. Chatbots can be used for a variety of purposes, including talking, entertainment, data querying, agent execution tasks, questioning and answering, and dialogue training (Copulsky, 2019). For instance, a chatbot can assume the role of an agent to collect information from chats to execute a form-filling job, such as purchasing goods or booking airline tickets and restaurants (Moriuchi et al., 2021).

The interest in chatbots in the smart tourism research domain is ongoing. Melián-González et al. (2021) found that chatbot usage in tourism companies is influenced by expected performance, habit, hedonic component, self-service technology, social influence, and human-like behavior. Hasan et al. (2021) studied how chatbots can help the tourism industry in situations where social distancing is required. More specifically, they found that automation, habits, social presence, and health awareness positively impacted intention to use chatbots. In the study of AI-powered chatbots for hospitality and tourism in India, Pillai and Sivathanu (2020) found that technological anxiety did not influence adoption intention, while stickiness to traditional human travel agents negatively moderated the relationship between adoption intention and actual usage of chatbots. Orden-Mejia and Huertas (2022), who examined the relationship between informativeness, empathy, accessibility, interactivity, and chatbot user satisfaction, discovered that informativeness, empathy, and interactivity influence and predict tourist pleasure, but accessibility did not.

Prior research has mostly focused on the positive and negative aspects of chatbot use by tourists. It is unquestionably an intriguing issue to investigate why people appreciate chatbots. Yet, given that tourists collect information from tourist guides or tourist information applications and utilize it for tourism-related reasons, it would also be worthwhile to concentrate research efforts on the quality of information offered by chatbots. Personalized chatbots that mirror the user's profile are more likely to be considered as valuable (Arreza, 2022). To provide better tourism service, it is also useful to design and employ metrics to evaluate the quality of the chatbot's conversations (Chen et al., 2022). In addition, technical research is required to enhance the service performance of chatbots in to provide a tourism-rich experience with a greater variety of data sources.

2.2. Open AI

Open AI is an artificial intelligence (AI) company declared mission is to promote and create "friendly AI" for the benefit of humanity as a whole (Brockman et al., 2015). The San Francisco-based organization was founded by a Silicon Valley who's who of tech magnates (Metz, 2016): Elon Musk, LinkedIn founder Reid Hoffman, PayPal co-founder Peter Thiel, former Stripe-Chief Technology Officer Greg Brockman, and Y Combinator founder Sam Altman. Brockman and Altman continue to serve as President and Chief Executive Officer of OpenAI, respectively in 2023. OpenAI has rapidly become one of the world's leading artificial intelligence research laboratories (Hao, 2020).

OpenAI targets to develop an artificial general intelligence (AGI, in short). AGI, often known as 'strong AI', is the kind of holy grail of AI referring that a machine accomplishes any intellectual work that humans can (McAfee & Brynjolfsson, 2017). According to the initial OpenAI mission statement, artificial intelligence was to be created in a manner that is safe and helpful to humanity, and open-source software and advanced AI tools should be distributed to the public without intellectual property constraints (Markoff, 2015). Like other non-profit organizations that pursue sustainability, OpenAI's vision is being continuously realized with the help of freemium and other financial supports from business partners. Although in 2019, OpenAI changed from a non-profit to a for-profit business with a greater emphasis on sustainability, and in July 2019, OpenAI received a \$1 billion investment from Microsoft (Brockman, 2019). In 2020, it was revealed that OpenAI's artificial intelligence model, generative pre-trained transformer-3 or GPT-3, would be licensed solely to Microsoft, and in 2023, OpenAI technology will be integrated into Microsoft's Bing search engine. In part, early OpenAI founders, including Elon Musk, reacted negatively to this move (Hao, 2020), but it also fueled impatience among other innovators working on conversational AI, resulting in greater competition.

According to Cooper (2021), OpenAI achieved a big AI advancement in 2020 with the introduction of GPT-3, which was trained on a vast quantity of data consisting of hundreds of billions of words, or 45 terabytes of text. Common Crawl, a non-profit organization that offers free web archives and datasets to the public, WebText2, which consists of the text of web pages from outbound Reddit links with more than three upvotes, as well as two internet-based books corpora (Books1 and Books2) and Wikipedia were used to train GPT-3 (Brown et al., 2020). GPT-3 is the largest and most powerful language model, utilizing deep learning to generate text for various tasks such as essays, stories, poems, code, image autocompletion, translation, and calculations without requiring specific training. Unlike traditional NLP systems that require laborious and expensive fine-tuning through supervised learning on a labeled corpus, GPT-3 can learn from any text (Grossman, 2020). OpenAI launched GPT-4 on March 14, 2023, a new language model that extends GPT-3. Access to its commercial application programming interfaces (APIs) is granted through a waitlist.

AGI has the potential to change the tourism business by providing not only necessary information, but also cultural and historical insights, extensive travel advice, and more. By utilizing the power of AGI, tourist applications may provide a personalized experience to each user by delivering material based on their interests, preferences, and requirements. In addition, AGI can surprise users with unexpected knowledge and experiences, enhancing the enjoyment and memorability of their travels. Whether proposing hidden jewels in a city or providing insights into the local cuisine, AGI may assist users in exploring and discovering destinations in novel and fascinating ways. As AGI technology continues to improve, we can anticipate even more imaginative uses in the tourism industry that will enable us to travel the globe in ways never before imaginable.

2.3. ChatGPT

A chatbot is an artificial intelligence-based software program capable of simulating human dialogue. ChatGPT is a conversational service based on GPT-3 or GPT-3.5 from OpenAI. OpenAI's enterprise value has been predicted to be 29 billion USD since its preview release on 30 November 2022 (Jin & Kruppa, 2023). ChatGPT can reply to user inquiries within seconds and actively processing user requests based on pre-trained models, as opposed to merely chatting. It is also programmed to remember context and adapt its responses to present users with the required information. InstructGPT, a model trained to provide detailed responses by following instructions in prompts, is a sibling to ChatGPT. Although the OpenAI API uses GPT-3 language models to perform natural language tasks through text prompts, these models may generate untruthful or harmful outputs. To enhance safety and alignment with users, OpenAI fine-tunes GPT-3 using reinforcement learning from human feedback (RLHF). Labelers demonstrate desired behavior and rank model outputs on customer prompts, resulting in improved InstructGPT models that better adhere to instructions, generate less false information, and exhibit minor reductions in toxic output generation (Ouyang et al., 2022).

ChatGPT is unique in that it has reinforcement learning as a component. It employs a technique known as Reinforcement Learning from Human Feedback (RLHF) to lessen the risk of damaging, dishonest, or biased responses. It employs a combination of unsupervised and reinforcement learning, which has been fine-tuned to adapt to various inquiries and learn human linguistic standards. In detail, ChatGPT learns from data using unsupervised learning, which includes training the model on immense quantities of text data without explicit human supervision or direction. This enables ChatGPT to automatically discover patterns and relationships in the linguistic data and apply this knowledge to generate responses to new input that resemble those of a human. The learning algorithm comprises feeding the model a massive corpus of text data, including books, papers, and internet information, and analyzing and processing the input with a deep neural network. Each layer of the network does a distinct sort of data processing, such as recognizing patterns, correlations, and recurring themes. During training, the model optimizes its power to predict the next word in a sentence or generate coherent and grammatically accurate responses by adjusting its internal parameters, or weights. This is accomplished through the backpropagation method as usual deep-learning algorithms do, which compares the model's predictions to the actual output and adjusts the weights to minimize the error. RLHF is a method for enhancing the performance of language models with using reinforcement learning, a sort of machine learning in which an agent learns to maximize a reward value, to train the language model to generate more human-like responses. In the context of ChatGPT, RLHF performs by training the model to maximize a hybrid reward function with various objectives, including fluency, relevance, and diversity. The *fluency* objective assesses how grammatically correct and natural-sounding the generated response is. The *relevance* objective examines how well the response matches the input prompt, and the *diversity* aim assesses the response's dissimilarity to other feasible answers.

Large language models (LLMs) have shown impressive computational abilities through their capacity to understand natural language instructions. However, their performance in specific tasks is greatly affected by the quality of the prompts that guide them, with the most effective prompts having been created by humans (Zhou et al., 2022). A prompt is a series of instructions or signals provided to a computer program to direct its behavior or output (Beurer-Kellner et al., 2022). Table 1 outlines some of the ChatGPT prompt instructions and their results partially.

Table 1. Examples of prompt codes in ChatGPT

Prompt Example	Response Example
"Tell me a joke."	Why don't scientists trust atoms? Because they make up everything! ... The meaning of life is a philosophical question that has been debated by scholars, theologians, and individuals throughout history. There is no one definitive answer to this question, as different people and belief systems have different perspectives on what the meaning of life may be. ...
"What is the meaning of life?"	... "The Nightingale" by Kristin Hannah is a historical fiction novel that tells the story of two sisters in France during World War II. It's a gripping and emotional tale of love, loss, and survival, and it has received critical acclaim for its beautiful prose and powerful storytelling. ...
"Can you recommend a good book to read?"	... La Promenade Plantée: This elevated park is located in the 12th arrondissement and was the inspiration for the High Line in New York City. It offers stunning views of the city and is a great place to take a leisurely stroll. ...
"Can you recommend some hidden gems for travel enthusiasts in Paris?"	... The St. Regis San Francisco: This luxury hotel is located in the heart of San Francisco and features modern amenities and top-notch service. ...
"Recommend me the best hotel in San Francisco."	... Set your pickup location: Open the app and make sure that your current location is accurate. If it's not, you can manually enter your pickup location. ...
"How can I use Uber?"	

Depending on how you use the prompts, ChatGPT can produce different results. For example, depending on the details of your travels in Seoul, ChatGPT will give you completely different results (see Table 2). Importantly, the more information users supply, the more they limit the scope of the answer, and the clearer the questioner's intent, the more likely the chatbot will provide a decent response. The capacity to adjust to user questions and conversations is what makes prompt engineering techniques and tricks so crucial for positive chatbot experiences.

Table 2. Different results produced by prompting style

"What is an interesting thing I can do when I visit Seoul?"	"What is an interesting event I can enjoy when I visit Seoul for fun?"
... There are many interesting things you can do when you visit Seoul. One unique experience is visiting a traditional Korean bathhouse or jjimjilbang. These bathhouses offer a variety of services such as saunas, hot tubs, massage, and even sleeping rooms. They are a great way to relax and unwind after a long day of sightseeing. ...	... Seoul Lantern Festival: The Seoul Lantern Festival is an annual event held in November and December, and features beautiful lanterns in various shapes and sizes. The lanterns are displayed along the Cheonggyecheon Stream and provide a stunning sight at night. ...

In the realm of customer service, quality of service is an essential aspect of building and maintaining a strong reputation. While human agents are traditionally relied upon to provide excellent customer service, the growing use of chatbots presents a unique challenge. In the context of tourism services, providing high-quality customer service is crucial to the success of businesses in the industry. While chatbots have the potential to offer efficient and cost-effective solutions for customer support, they may also present unique challenges. Tourists may have specific needs and requirements that are best addressed through human interaction. For example, a tourist may require personalized recommendations for local restaurants, cultural events, or tourist attractions, which a chatbot may not be equipped to provide. Another challenge in utilizing chatbots in the tourism industry is the difficulty in asking the right questions to elicit the desired response. The complexity and flexibility of creating chatbot prompts can make it challenging to anticipate all possible queries from customers. Furthermore, customers may have

different phrasing or wording preferences that may not match the prompts programmed into the chatbot. This can result in a frustrating experience for the customer and may even deter them from using the service in the future.

3. Designing Rules for AI Middleware

3.1. Rising of Prompt Middleware

Chatbot technology has transformed the way travel guide inquiries are answered. Previously, tourists relied on human agents for directions and recommendations. Now, chatbots, including generative AGIs like ChatGPT, offer high-quality service and efficient responses. Unlike traditional chatbots, ChatGPT is responsive to user demands, offering a personalized experience. However, middleware is required to ensure that chatbots ask the correct questions. This technology allows chatbots to provide a streamlined and efficient customer service experience, enhancing overall travel enjoyment. Chatbots are now a vital component of the tourism sector, providing travelers with the assistance they require.

When traveling, individuals require information to navigate unfamiliar environments and make the most of their experiences. Traveling is a dynamic process that involves both the consumption and production of information, which has been supported by various studies. The unequal distribution of information between tourism service providers and tourists is a common problem in the tourism industry, known as information asymmetry. To address this issue, human-prompted middleware has been widely used to provide tourists with relevant information and assist them in planning their trips. However, with the rise of free independent travelers and the use of technology such as mobile apps, there has been a shift towards using functional middleware to replace human prompt-support middleware. As artificial intelligence technology advances, it is likely that we will see a return to AI prompt-support middleware in the future. This will enable tourism service providers to provide more personalized and efficient services to tourists, leading to a better overall tourism experience. Ultimately, the challenge will be to strike a balance between the use of technology and the human touch, to ensure that tourists receive the best possible service.

Human prompt-support middleware (HPM) acts as a travel guide, understanding the needs, desires, and requirements of travelers. They have rich experiences and knowledge enough to handle questions even if the traveler is not able to provide enough information or if the question is poorly phrased. HPM can provide travelers with more favorable questions and answers, and act as intermediaries between business operators and travelers at the destination. They can provide a more advantageous position for the traveler and mediate between them and the service providers.

It should be noted that tourists sometimes can face difficulties in resolving information asymmetry due to human travel guides themselves. Despite the experience and knowledge that travel guides possess, the tourists may still encounter issues such as cost and irrationality, which can make tourists even harder. Free independent travelers (FITs) have found ways to smartly address this problem by utilizing a set of *functional middleware*. FITs have a variety of mobile apps available to them, which they can use to address information asymmetry. For example, they can use language translation apps such as Google Translate to communicate with locals in foreign countries. Navigation apps such as Google Maps or Waze can help them find their way around unfamiliar places. Travel planning apps such as TripAdvisor or Expedia can help them book flights, accommodations, and activities. Social media platforms such as Instagram or Facebook can also provide them with travel inspiration and recommendations from other travelers. By using a combination of these apps, free independent travelers can gain access to a wealth

of information and plan their trips more efficiently.

AI prompt-support middleware (APM) serves as a mediator between generative AI and human users. It actively provides the necessary information to AI for quicker and more accurate responses to specific situations and demands, while delivering essential information that users require in a familiar interface. Additionally, it offers specialized services for learning, travel, finance, and other areas. AI prompt-support middleware enhances the service value of AGI, or artificial general intelligence by automatically generating necessary prompts and supplementing insufficient information provided by users to improve prompt performance. In summary, AI prompt-support middleware improves the efficiency and effectiveness of generative AI by serving as a bridge between the AI and human users, enhancing their overall experience. Compared to AGI, the artificial intelligence responsible for APM is an artificial specialized intelligence (ASI) that relies on specialized data and training results to provide services. ASI can contribute to enhancing the business functions of AGI. For instance, in the context of education and research, when reading and analyzing papers and providing summaries of the content, AGI such as ChatGPT can be of assistance. In this case, ASI can provide necessary contextual information, express results according to researchers' demands, or verify the reliability of the results produced by ChatGPT. Overall, ASI can complement AGI by providing specific and customized support for various business functions.

3.2. Service Design for AI Prompt-Support Middleware

The Elaboration Likelihood Model (ELM) is a theoretical framework that explains how people process persuasive messages and make decisions. According to Cacioppo et al. (1986), there are two routes to persuasion: the central route and the peripheral route. The central route involves a careful analysis of the message content, while the peripheral route relies on superficial cues such as the attractiveness of the speaker or the emotional appeal of the message. The extent to which people engage in elaboration, or deep thinking about the message, determines which route they take. Petty and Cacioppo suggest that persuasion is more likely to occur through the central route when people are motivated and able to process information deeply, while persuasion through the peripheral route is more likely when people are not motivated or able to process information deeply. In everyday life, people tend to process information using heuristics for routine and repetitive information demands (Gigerenzer & Gaissmaier, 2011). For example, checking the weather, traffic information, and booking information are tasks where the information cues for how to query and interpret the information are well-defined. Such information typically requires low levels of elaboration and is primarily processed through the peripheral route (Petty & Wegener, 1998).

On the other hand, when dealing with unfamiliar or complex information, it is important to carefully consider and understand the information through as much available material as possible (Johnson-Laird, 1983). In situations where personal safety or financial loss is at stake, or when specialized knowledge such as legal expertise is required, individuals tend to process information through the central route rather than relying on heuristics or information cues. This indicates a greater demand for information (Cacioppo et al., 1986). Information seekers may not have sufficient knowledge of the required information and therefore require external sources of information (Petty & Wegener, 1998). Additionally, they may struggle to search for and select relevant information that will be helpful (Johnson-Laird, 1983). Therefore, processing information through the central route may require a significant amount of time and effort.

Table 3. Rules for designing ASIs: prompting and communicating

Information Requirement	Information Presentation	Prompting	Communicating
High	Friendliness	The prompts crafted by the ASI should cater to the user's desired depth and volume of information, while also gathering any additional data that could suggest familiarity.	To ensure friendliness, the ASI should engage in conversations that employ vocabulary and context tailored to the user's preferences.
	Professionalism	The ASI should be ready to retrieve any essential supplementary information from its knowledge base and merge it with the data supplied by the AGI.	Apart from written content, it is crucial to offer a diverse range of multimedia information, reference documents, and data.
Low	Friendliness	The ASI should assist users to input as few details as possible to obtain necessary information efficiently.	To display friendliness, the ASI can employ words, emojis, and emoticons.
	Professionalism	So that the AGI understands the breadth and depth of the results they provide, queries should represent user requirements for deliverables.	The ASI can store the user's necessary information and quickly retrieve it when required, or share it for other purposes.

*AGI stands for artificial general intelligence (e.g., ChatGPT) and ASI means artificial specialized intelligence, which is an AI prompt-support middleware (APM) system for tourists in this paper.

The relationship between tourists' information processing effort and the ELM has been repeatedly mentioned in previous studies. Kim and Fesenmaier (2008), for example, conducted a study on the persuasive design of destination websites, analyzing how such websites can be designed to attract tourists to visit a particular location based on the ELM. By applying the ELM, Jun and Vogt (2013) identify interdependent relationships on tourism information processing in low- and high involvement situations, respectively. Specifically, tourists may use different processing strategies depending on the type of data presented such as pictures and documents (Jun & Holland, 2012).

Based on the discussions we derive the following system design rule for APM:

Rule (information requirement): Depending on the level of information processing needs of the tourist, the necessary external information should be used for knowledge provision or heuristic queues should be provided.

When using a chatbot, it is crucial to keep in mind that the interaction is based on a conversation with the user. The tone and style of communication can be crucial in successfully completing transactions. It's not just about conveying information, but also about creating a sense of friendliness and professionalism. How to make the user feel at ease and how to convey expertise are both important considerations. Effective communication and a positive attitude of tour guides play a crucial role in shaping the tourist experience, in addition to their physical appearance (Tsai et al., 2016). Good communication skills that are easy to understand and adapted to the audience level, along with a friendly and enthusiastic attitude can create a positive and memorable experience for tourists. The linguistic communication skills and expertise of tour guides affect the quality of tourism (Zhang & Chow, 2004), indicating that a tourism chatbot, such as APM, should be capable of utilizing various levels of communication modes that encompass both friendliness and professionalism.

The incorporation of a cute and approachable design for a chatbot can help mitigate the negative effects of service failures by creating a sense of empathy for users (Xing et al., 2022). Providing prompt and effective responses to service failures through the chatbot can also increase user trust and loyalty, while utilizing user feedback to improve chatbot performance can enhance overall user satisfaction and prevent future service failures (Zhang et al., 2022). In the event of a service failure, it can be advantageous for a chatbot to independently manage the issue with the consumer. Using a linguistic style that is little youthful, charming, and cute can help to produce a more approachable and empathic chatbot that is better equipped to handle challenging situations (Song et al., 2022). Nonetheless, there are situations in which a chatbot must tackle serious themes with the right gravity, such as healthcare, safety, historical facts, finance, and insurance (Chaves & Gerosa, 2021). In such cases, it is essential to equip the chatbot with proper language expressions and supplementary materials that address the topic accurately and with sensitivity. This may involve employing appropriate terminology, providing

thorough explanations, or linking to credible information sources. Also, it may be necessary to include a disclaimer or a caution before discussing sensitive topics so that users are informed of the potential ramifications of the debate. The ultimate objective is to develop a chatbot that is informed, compassionate, and cognizant of the seriousness and potential impact of the information being delivered.

Based on the discussions we derive the following system design rule for APM:

Rule (information presentation): APM must autonomously and dynamically determine appropriate language style and conversational attitude based on the seriousness of the topic or context of the conversation.

These two rules create four dependent intersections, each of which leads to the characteristic service design elements of APM for tourism services. Each area can be represented by a 2 by 2 matrix, depending on the level of information requirement, whether it is low or high, and whether the information presentation mode is friendly or professional. The design characteristics for the ASI's communication with the AGI and the end user, based on the information requirement and presentation, are summarized in Table 3.

4. Consideration

4.1. Personal Information Protection

Ensuring privacy is of utmost importance, and the collection and usage of tourists' profile information and movement data should only occur under specific circumstances and authorized service applications. Directly collecting and processing multiple services that tourists require through AGIs poses privacy risks. It is challenging to apply and manage various legal and institutional regulations directly to AGI, and intervening in specific cases becomes problematic due to the complex nature of AGI and the vast number of users it targets. Moreover, consulting with the company that manages AGI on a case-by-case basis regarding issues raised by the government or regulatory authorities is also challenging. Therefore, it is recommended to obtain and use personal information at the middleware level, such as ASI, that relies on AGI to ensure privacy. To ensure that tourists can benefit from the natural conversation provided by ChatGPT and the high service quality offered by ASI, service applications must be designed to recombine personal information and movement data by reprocessing the results using ChatGPT.

4.2 Ecosystem

Tourist information services tend to be dynamic, with varying levels of friendliness, professionalism, and information requirements. Instead of an ASI that only supports one mode

based on the conversation's progression, it is preferable to combine various ASI applications through a cloud service. This means that an AI can be better utilized for smart tourism by creating an ecosystem where multiple ASIs delivered as a Software-as-a-Service type in tandem when tourists use non-assisted AI services or functional end-user applications such as map services or weather checking services. ChatGPT's open API structure allows it to interface with ASIs via APIs. However, to make the ecosystem more active, there is a need to establish data schemas for working with AGIs like ChatGPT. The information exchange between AGIs and ASIs must more precisely convey service intent and standardize the type and content of data inputs and outputs so that multiple AGIs and ASIs can quickly and accurately respond to tourists' more specialized needs. This can facilitate the design and utilization of more functional ASIs tailored to meet specific service requirements.

5. Concluding Remarks

The tourism and hospitality industries are constantly adapting to the latest technological advancements to provide customers with a more convenient and personalized travel experiences. The use of IT applications such as ChatGPT has become increasingly popular in recent years, as it allows companies to interact with customers in real-time and provide them with tailored recommendations based on their preferences. It is worth noting that the emergence of large-scale artificial intelligence (AI) systems offers the prospect of creating and leveraging smaller middleware AIs with specific functionalities in the tourism services sector. For these applications to reach their full potential, there is a need for standardized data schemas that can facilitate information exchange between AGIs (Artificial General Intelligence) and ASIs (Artificial Specialized Intelligence). This will enable companies to provide customers with more accurate and relevant information about tourist destinations, as well as offer personalized recommendations that are tailored to their individual needs.

The two rules discussed in this paper are related to the APM system, which serves as a mediator between generative AI and human users. The first rule is the Information Processing Rule, which states that the APM must autonomously and dynamically determine appropriate responses based on the context of the conversation. This means that the system should be able to understand the user's intent and respond accordingly, using natural language processing techniques. The second rule is the Information Presentation Rule, which states that the APM must autonomously and dynamically determine appropriate language style and conversational attitude based on the seriousness of the topic or context of the conversation. This means that the system should be able to adjust its tone and style depending on whether it is dealing with a serious or lighthearted topic, to provide a more personalized experience for users.

In our view, the conceptual model we have presented in this paper is, yet another facet of the ecosystem created by cloud systems. As lower-level cloud services continuously merge with larger, higher-level ones, they offer distinctive and specialized values to users; that is, cloud systems for various services underpin storage, computation power, databases, and user-facing systems. We contend that the advancement of artificial intelligence will follow a similar path, with increased communication and collaboration between AI systems. In the realm of smart tourism research, this will necessitate more efforts to uncover the way of acquiring natural and user-centric interfaces between human tourists and the various layers of AI services that support them. To design and implement effective smart tourism services, it is crucial to engage in further and deeper discussions regarding factors to be considered in achieving desirable outcomes.

Declaration of competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this research note.

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