

Research of Interaction Method Design for In-flight Entertainment System Based on Passengers' Preference

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Abstract

In-flight entertainment system (IFE) is a multimedia entertainment platform provided by airlines company in their cabin. From the 1990s, more and more airlines company spent billions of money to improve their entertaining and user experience of IFE to win more market. Traditionally, passengers general use remote control handle to join the IFE interaction. Nowadays there are many new devices such as touch screen, smart handle, Pad to be the interaction control platform. In this paper, we research the different interactive methods based on passengers preference to explore a new interactive method to build a next-generation cabin. That will improve the entertaining and user experience of IFE.

Key words: In-flight Entertainment System (IFE), UX Interaction Methods, Passengers Preference, Next Generation Cabin

Research Background

With intercontinental flights began operating In-flight entertainment system (IFE) has been developed a century. In 1921, an airline company –Aeromarine Airways designed the world first IFE system that immediately received wide acclaim and won an impressive performance. Into 21st century the first ten years, with the rapid development of multimedia technology, the contents of IFE system from traditional passive demand VOD to one person one screen – active recreation. On interactive methods that from a conventional controller to today's touchscreen interactive control. With the improvement of contents and control methods that improve its entertaining and friendly operator. Nowadays, many of human computer communication devices appear into our sight, the control methods of the IFE system will have a breakthrough

Research Significance

When a passenger in the air, he stays in a very narrow space about half square meters, even the latest styles first class seat his space just two square meters. Stay in such narrow space it affects our scope of activities.

With the development of modern technology, the requirements of passengers for in-flight entertainment system are becoming more and more demanding. How to design a comfortable entertainment for a passenger will become a puzzle for designing a new IFE for airlines companies. From this research, we think about how to use new technology, a new

platform to create excellent IFE interactive methods for passengers. During our study, we have fully collected the passengers' options and suggestions. We combine with existing technologies that design next generation IFE system in order to improve the deficiencies of the recent IFE systems and relieve the burden for passengers in the entertainment process allow the passengers can participate in more and more entertainment and enjoy it.

The Passenger Survey

A passenger is the principal part take part in the interactive of IFE system. In this research, we have invited 236 passengers to conduct the investigation. In order to make research results have more value for research that we have invited passengers who form china, South Korea, USA, Japan, Oceania, Europe. They are from different industries and social backgrounds, different income levels and ages.

TABLE I
PASSENGER PROFILES

Attributes	Sample Number	Frequency(%)
Age		
Less than 18	2	0.85
19-30	187	79.24
31-40	37	15.68
41-60	9	3.81
60 and over	1	0.42
Degree		
High School	4	1.69
Undergraduate	156	66.1
Master	59	25
Doctor	17	7.2
Income(USD/m)		
Less than 500	88	37.29
501-1000	12	5.08
1001-2000	55	23.31
2001-3000	50	21.19
3001-5000	10	4.24
5001-7000	8	3.39
7001-10000	8	2.54
1001 and over	4	1.69
no income	3	1.27

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th Other studies show that passenger ’s education and income is an important factor to affect service quality satisfaction of airlines companies due to increased education that passengers will increase service quality requirements for airlines. Due to income growth, more and more high-income passengers became a frequent flyer. At the same time, from our survey highly educated high-income passengers presents a trend to younger in these years that led to a substantial rise of experience requirement for the IFE system. Used function and most anticipated features have a movie, flight data, internet service, latest music showing the intersection in our survey. In addition to that, the cabin outside vision become a rising star that due to high-end passenger younger.

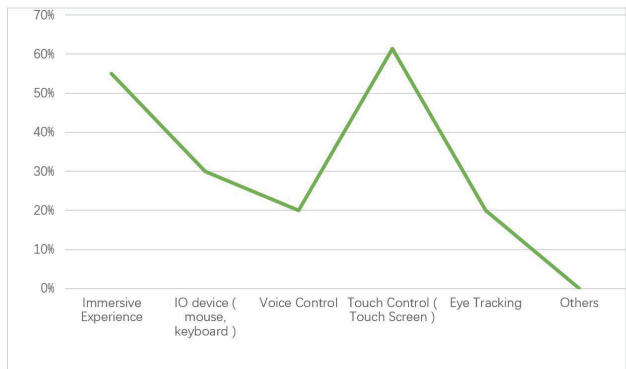


Fig. 1 Passenger's Preference Human-computer interaction ways.

In survey of human-computer interaction, passengers preferred to human-computer nature language communication, then is immersive experience. In survey of interaction methods, passengers preferred to use touch screen then they would like to try a hand gesture control way to IFE system.

TABLE II
PASSENGER’S MOST USED AND MOST EXPECTATION FUNCTIONS

Attributes	Sample Number	Frequency(%)
Most Used Functions		
Latest movie	88	45
Flight data	27	14
Wi-Fi onboard	14	7
Top 10 Music	13	7
Latest Drama	11	6
Others	42	21
Most Expectation Functions		
Latest movie	64	32.65
Wi-Fi onboard	44	22.45
Outside camera	26	13.27
Flight data	11	5.61
Online chatting	10	5.1
Others	41	20.92

Contents and Method

According to feedback of passengers survey shows that the

following characteristics of a next generation IFE system is needed. First is new contents, second is scalability, third is immersion experience, fourth is nature control methods. In this study we focused on last two parts.



Fig. 2 THALE’s Hand Gesture Control IFE System.

World’s leading provider of cabin entertainment equipment THALES has been introduced two new products in 2012 and 2014. In Fig.2 is THALES’s next generation IFE system that use eye tracking systems as their interaction method. In Fig.2 is THALES’s hand gesture control, this type of identification system uses the hand tracking device, it is also a natural language based control methods. As you can image, natural language human-computer interaction has been more and more used in cabin contents design.



Fig. 3 The Environment Setting.

As a research of interactive methods of next-generation IFE system. We follow the times' trend that recommends the natural language interaction into our design. We have chosen leap motion hand gesture recognition device as a communication bridge to IFE system. We run our works on a unity3D platform. The leap motion device can identify a range of 150 degrees, and the gesture motion range is 7-25cm in a 3D space. This feature is consistent with the environmental requirements of the cabin seat narrow space. At the same time the device is a mini device we set it into table plate of each seat. From this innovative platform that allows passengers to enjoy in-flight catering, reading a magazine, it uses hand gestures to control the IFE system. According to our survey, we also reserve the seat back touch screen to suit different applications.

Conclusions

IFE systems based nature hand gesture interaction combine with a touchscreen is a solution of existing cabin experience

and to meet the future requirements of next-generation cabin experience. This type of interaction enhances the users' immersive experience, make passengers can easily join the IFE system, improve their satisfaction and quality in air.

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