Heliyon 9 (2023) e16346

Contents lists available at ScienceDirect

Heliyon

journal homepage: www.cell.com/heliyon

Research article

Extending UTAUT2 with knowledge to test Chinese consumers' adoption of imported spirits flash delivery applications

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ARTICLE INFO

Keywords:
UTAUT2
Knowledge
Risk
Innovativeness
Flash delivery
Spirits

ABSTRACT

Despite the rapid growth in sales of imported spirits in the Chinese market, consumers are struggling to easily buy high-quality imported spirits with favorable price. The imported spirits flash delivery applications are proposed to provide Chinese consumers with high-quality services delivered within a few hours. This study extends UTUAT2 with knowledge, risk and innovativeness to identify factors influencing Chinese consumers' use of flash delivery services for imported spirits. With the help of service providers, 315 valid questionnaires were collected and an empirical study was carried out. Findings suggest that social influence, habit, innovativeness and knowledge all have significant effects on usage. In particular, knowledge has significant moderating effects on relationships between social influence, habit, innovativeness and usage. This research is supposed to help imported spirits flash delivery providers to further expand the market, and will be of great help to the investment decisions of multinational spirits manufacturers in China.

1. Background

The world's two largest spirits producers, Pernod-Ricard and Diageo, have set up their own production bases in China to meet the strong demand from Chinese consumers. Even in the past few years during the global epidemic, the annual sales of imported spirits have maintained rapid growth in China due to spirits producers' effort in advertising and interaction with consumers [1]. Imported spirits appear to be one of the most popular products among Chinese consumers of all ages because of fascinating taste and organic manufacturing process [2–4]. In order to profit from such a large market, many companies have joined in, including those biggest spirits companies that do not have factories in China. Hennessy, the premium spirits brand under the LVMH Group, has officially announced its entry into Chinese e-commerce platform. In the 5G era, imported spirits products could adopt new business models to meet habits of Chinese consumers, because the accumulation of big data in new retail is helpful to provide a practical support for alcohol corporates' decision-making [5–11].

Social media marketing may not be the best marketing method for imported spirits marketing, as most streamers in China do not have professional knowledge of imported spirits evaluation, and high commissions may increase the retail price of spirits. For luxury brands, extensive social media marketing may lower their position in the minds of high-end consumers. Imported spirits products

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https://doi.org/10.1016/j.heliyon.2023.e16346
Received 15 July 2022; Received in revised form 9 May 2023; Accepted 12 May 2023
Available online 16 May 2023
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could adopt new business models to meet habits of Chinese consumers, because the accumulation of big data in new retail is helpful to provide a practical support for alcohol corporates' decision-making. With the help of 5G and other technologies, imported spirits brands can accurately target customers and analyze the data of target users to find their preferences. Under such conditions, brands can use this data to create marketing promotion content that matches the taste of the audience, thereby improving the effectiveness of marketing promotion. Imported Spirits Flash Delivery Applications based on 5G technology can analyze consumers' opinions and suggestions on marketing content, and then pass them on to content platforms and advertisers in a timely manner. With this mechanism, the actual needs of the target group can be more accurately understood, and the marketing direction and content can be adjusted in time.

While e-commerce sites can sell all kinds of imported spirits, delivery time of up to several days may not be able to meet customers' sudden demand, especially given China's vast territory and more than 600 cities. Furthermore, due to the high profit of spirits, there are some fake spirits on the market, which makes consumers very cautious before buying. A genuine and convenient online imported spirits sale platform nearby consumers will both allow consumers to choose spirits with confidence, and greatly increase the sales of imported spirits.

Traditional express companies are more cost-oriented on scale and require efforts to minimize the cost of each single piece. Each courier hopes to collect as many pieces as possible when receiving, delivering, and sending in order to decrease the cost. Obviously, this traditional express business model cannot meet the needs of consumers of imported spirits because consumers pay more attention to fast delivery service and product quality without considering delivery cost too much. Thus, imported spirits' flash delivery service became the focus of competition for many e-commerce companies [12]. Since 2020, some of China's largest e-commerce companies, Tencent, Meituan, JD.com, etc., have begun to invest heavily in the establishment of an intra-city flash imported spirits delivery service. They have set up imported spirit stores in many Chinese cities and launched their own service applications, claiming that they can deliver imported spirits to every corner of the city within a few hours.

There are plenty of previous studies on delivery services, but most of them are limited to food, medicines, and documents deliveries [13–15]. Interestingly, only few previous researchers focused on imported spirits consumption especially about its flash delivery service adoption. Therefore, the purpose of this study is to expand UTAUT2 with risk, innovativeness and knowledge to explore the factors that can influence consumers' acceptance of imported spirits flash delivery services. This research is trying to find useful suggestions for spirits importer and flash delivery platforms to make decisions based on empirical results. Also, the empirical results are supposed to be helpful for whiskey and brandy producers in Europe and the United States in formulating product pricing and marketing strategies in China.

To achieve these research goals, this study firstly conducts a literature review of the latest delivery marketing strategies and extensions of the UTAUT2 model. Then, the UTAUT2 model is appropriately extended according to the characteristics of imported spirits flash delivery service in China and hypothesis are proposed. To test the hypothesis, Smart-PLS was used to test the results after the questionnaire was collected. Finally, research conclusions and recommendations are given.

2. Literature review

2.1. Previous researches on delivery service adoption

Most previous researches only focus on user satisfaction or delivery efficacy, and the objects of their studies were limited to food delivery platforms as shown in Table 1. This is totally different from imported spirits flash delivery applications, such as 9bianli, TCJK, Jiuxian, Jd9sj etc. These applications are merely designed to delivery spirits in time, and are new e-commerce styles that combine online stores of imported spirits with flash delivery providers, which breaks through the barriers of connection between online and offline consumption of imported spirits. When users log into the applications that offline imported spirits stores publish their products, they can view the detailed information of various spirits before purchasing. After applications receive the consumers' order, they will quickly deliver the imported spirits to the consumers' location. From consumers' payment to completion of delivery, the whole time generally does not exceed 3 h. Consumers can also pay more for shorter delivery time, for example, some applications offer 30-min delivery service. These flash delivery applications have strong information integration capabilities, and they have gathered a large

Table 1
Previous research on delivery service.

Authors	Research factors	Issues
Hwang et al., 2019 [16]	Innovativeness, Attitude, gender, age	Drone food delivery service adoption
Javed & Wu 2020 [17]	After-services, Trust, Satisfaction,	Repurchase intention of delivery services
Zhou et al., 2020 [18]	Risk, Social influence, Satisfaction, Intention,	Parcel services for last-mile delivery adoption
Kim et al., 2021 [19]	Attitude, Innovativeness, Norm, Behavior control	Contactless food delivery service adoption
Hong et al., 2021 [20]	Use, Trust, Benefit, Risk	Food delivery in pandemic
Uzir et al., 2021 [21]	Service quality, Value, Trust, Satisfaction	Delivery service adoption In developing country
Ray & Bala 2021 [22]	Benefit, Trust, Risk, Interaction	Travel and food delivery services
Fakfare & HTM 2021 [23]	Benefits, Use, Reviews, Hygiene, Time saving	Food delivery application on customers' satisfaction
Hwang et al., 2021 [24]	Eagerness, Vigilance, Openness, Novelty	Drone food delivery service adoption
Vakulenko et al., 2022 [25]	Residential type, Diversity, Satisfaction, Reuse	Rural and urban delivery services comparing
Kaur et al., 2022 [26]	Brand trust, Resentment, Apology, Compensation	Recovery strategies in food delivery applications

number of user behavior data in order to provide users with better services. Compared with the traditional consumption of spirits, flash delivery applications have many interesting features and advantages, such as more choices of spirits, reliable products, favorable prices, and time saving. Consumers can place an order from their smart phones at any location, such as a hotel, home, park, bar, etc., and receive it quickly.

2.2. Previous researches on extending UTAUT2

Unified Theory of Acceptance and the Use of Technology (UTAUT) was firstly promoted by Venkeatesh et al. (2003) [27], which include factors such as performance expectancy, social influence, facilitating conditions and effort expectancy. To further explain adoption behavior, Venkeatesh et al. (2012) [28] extend UTAUT with some new factors, such as hedonic motivation, habit, price value and some others, and the new model is named as UTAUT2. Since then, lots of researchers have used UTAUT or UTAUT2 in their research model. No matter how accurate the model is, many researchers find it necessary to extend it to better explain specific research objects. Table 2 gives some previous researches on extending UTAUT2.

Although the UTAUT2 model has been cited more than a few thousand times in Google Scholar, the UTAUT2 model is widely used to explain consumer acceptance of new technologies, and some studies directly use the UTAUT2 model as the base model, some are combined with other models, and some extend the UTAUT2 model. UTAUT2 has 3 main types of extended applications. The first is applied to new contexts, such as new technologies, new user groups and new cultural environments. The second type adds new structures, combined with other theories. The third is to introduce new elements to the UTAUT2 model and expand the theoretical boundary of UTAUT2 to better enhance its explanatory ability. With the development of global information and 5G communication technology, mobile apps have become a trend in consumer technology on a global scale, which further promotes research on the acceptance and use of personal technology. Since the subjects of this study are also consumers' acceptance of new things and technologies, this study adopts the UTAUT2 model and introduces new factors.

3. Hypotheses development

3.1. Social influence and usage

Social influence is the consideration of using a certain information technology by people who are considered important by the user [29]. It has been used in varieties of research fields including mobile payment, technology adoption by elders, and Internet banking [41–43]. Many flash delivery applications provide a QR code to verify the authenticity of each bottle of spirits in order to protect consumer' rights in the future. By online advertising, flash delivery applications always associate imported spirits with romance, health, European life style, reasonable prices, multiculturalism, career success, etc., trying to give consumers a completely positive influence. With the continuous appearance of imported spirits flash delivery applications advertised in movies, commercials, MTV, soap operas, they continue to visually influence Chinese consumers mentally. Although the Chinese government has banned many foreign social media, including Facebook and Twitter, it has never restricted any advertising of imported spirits flash delivery applications. In their advertisement, beautiful packaging of imported spirits and the fascinating exotic and romantic advertisements can always encourage people to buy more through their applications. Interestingly, Chinese hotels, nightclubs, and bars basically only provide imported spirits and wine to consumers, which associate imported spirits with the happy lives of successful people. Various media continue to encourage consumers to buy imported spirits in imported spirits flash delivery applications, and various advertisements continue to appear in front of consumers, which will prompt consumers to use them. Therefore.

H1. Social influence is positively related to imported spirit flash delivery applications' usage.

3.2. Habit and usage

Habit is defined as a behavior that an individual performs automatically through long-term experience and learning [29]. There are

Table 2
Previous researches on extending UTAUT2.

Authors	Extended factors	Research object
Merhi et al., 2019 [29]	Trust, privacy, security	Mobile banking adoption
Sun et al., 2019 [30]	Risk, Asset value	Investment in Cambodia
Kapser & Abdelrahman 2020 [31]	Perceived risk, price sensitivity	Autonomous delivery adoption
Nikolopoulou et al., 2021 [32]	Technological pedagogical knowledge	Teachers' intention to use mobile internet
Gansser & Reich 2021 [33]	Health, comfort, sustainability	Artificial intelligence adoption
Lian & Li 2021 [34]	Trust dimensions	Mobile payment adoption
Faqih & Jaradat 2021 [35]	Task fit, technology, task characteristics	Augmented reality technology in education
Korkmaz et al., 2022 [36]	Trust and safety, perceived risk	Autonomous public transport systems
Schmitz et al., 2022 [37]	Perceived security, product advantage	Telemedicine adoption
Grobe-Kreul 2022 [38]	Home security, home health, environmentalism	Adoption of smart energy
Medeiros et al., 2022 [39]	Satisfaction, benefits, self-image, rewarding	Travel tracking mobile application usage
Wu et al., 2022 [40]	National identity, perceived risk	Adoption of DCEP in China

plenty of researches have used habit factor to test different adoption behavior, including technology acceptance and mapping apps adoption [44,45]. Imported spirits flash delivery and traditional express delivery are completely different. Traditional express delivery will allow each courier to collect more parcels and deliver more express parcels within a certain period of time. With imported spirits flash delivery service, couriers generally only serve one customer at a time. Not only many couriers provide fast 24-h delivery of imported spirits, but also they provide consumers with additional services. They patiently explain the characteristics of each imported spirit to customers and demonstrate how to make cocktails to suit their tastes. The service of some imported spirits couriers has almost become a performance in customers' parties. Therefore, if users have similar needs, they will naturally think of using flash delivery applications. The applications system could quickly and accurately analyze users' preferences, purchase time, purchase frequency, purchase location, additional services and other big data, and then select warehouses, delivery routes and delivery vehicles. The constant communication between flash delivery applications and users will prompt users to form a habit to use those applications. Thus.

H2. Habit is positively related to imported spirit flash delivery applications' usage.

3.3. Innovativeness and usage

Innovativeness means consumers are comfortable with a high degree of unfamiliarity and are willing to take more risks [46]. Innovativeness is a key factor in many adoption researches, including online travel shopping, ERP adoption and portfolio investment [47–49]. Most of the services of flash delivery are one-to-one, and at the same time, in order to pursue high efficiency, the price of the service is relatively high. Imported spirits flash delivery applications have more specific functions, which are relatively new to consumers, such as voice or picture to text function. The user only needs to copy the voice or picture of the address, phone number and name into the applications, and the application system will automatically parse it and fill in the corresponding address, phone number and other information. Additionally, face recognition and drone have also been applied to flash delivery. These new technologies make imported spirit flash delivery more accessible to consumers who are highly innovative. Based on the above, it is concluded that.

H3. Innovativeness is positively related to imported spirit flash delivery applications' usage.

3.4. Perceived risk and usage

Perceived risk can be defined as the likelihood that consumers will suffer losses when using imported spirit flash delivery applications. Perceived risk has been widely used in all kinds of research fields including E-store image, hotel service, online payment and loan system adoption [50–53]. While applications can offer hundreds of imported spirits, consumers' time is limited. If consumers can't find the product they like quickly, they will give up the purchase. In order to help consumers buy quickly, applications will analyze consumers' age, gender, shopping habits and other big data to recommend suitable imported spirits. In order to gain more profits, some applications will recommend more expensive imported spirits instead of high-quality and cheap products to wealthy customers calculated by big data analysis. But the collection of consumer big data may violate consumer privacy. Furthermore, some applications may increase the price of flash delivery or the price of imported spirits during the peak shopping period for dinner and holidays. There are also some applications that will join to raise prices for those popular imported spirits at the same time, which also violates the interests of consumers. For consumers, the misuse of consumption data by applications is a great risk. Therefore.

H4. Perceived risk is negatively related to imported spirit flash delivery applications' usage.

3.5. Knowledge and usage

Knowledge, in this research, refers to consumers' understanding of the history, culture, value, brewing process and types of imported spirit. Knowledge has been an important factor which affecting different adoption behaviors, including organizational knowledge sharing, ERP simulation, customer co-creation value and employee creativity [54–57]. Brandy, Whiskey, Rum, Vodka, Gin are not as strong as Chinese traditional liquors, so imported spirits are very popular among Chinese young and female consumers. Quite a lot of Chinese consumers are aware of the classification, origin, brewing process and brands of imported spirits, which shows that Chinese consumers enjoy imported spirits not just for freshness. Additionally, most imported spirits' price is lower than most Chinese high-end liquors, which also increased Chinese consumers' preference for imported spirits. When consumers have a good understanding of the aroma, taste, type, grade and price of spirits from different countries, they will more quickly make choices on applications. If consumers know how to use spirits to create different cocktails, they will be willing to buy spirits and perform them in front of family and friends. In short, the more knowledge consumers have about spirits, the more confident they will buy them in applications. Thus.

H5. Knowledge is positively related to imported spirit flash delivery applications' usage.

3.6. Moderating effects of knowledge

Wang et al. (2018) [58] give that knowledge has significantly moderating effects on adoption of wikis knowledge integration. When consumers have enough knowledge to recognize useful information from social media and peers, they may find a discounted premium spirit quickly in applications and buy it, or recommend the valuable information to friends. This indicates that the more

knowledge consumers have, the more they will be influence by social media and peers to buy in applications. When consumers have enough knowledge about imported spirits, they may develop a habit of regularly consuming certain types of imported spirits. This indicates that the more knowledge consumers have, the more they will buy spirits in applications driven by habit. When consumers have enough knowledge about imported spirits, they will try more innovative ways to drink spirits, such as preparing different flavored cocktails and choosing different types of spirits for different occasions. This indicates that the more knowledge consumers have, the more they will innovatively buy imported spirits in applications for different purposes. When consumers have enough knowledge about imported spirits' price and quality, it's hard for them to be tricked by applications. This indicates that the more knowledge consumers have, the less risk they will perceive in purchasing in imported spirits flash delivery applications.

Based on the above discussion, it is concluded that.

H6. Knowledge has a positive moderating effect on relationship between social influence and usage.

H7. Knowledge has a positive moderating effect on relationship between habit and usage.

H8. Knowledge has a positive moderating effect on relationship between innovativeness and usage.

H9. Knowledge has a negative moderating effect on relationship between perceived risk and usage.

Fig. 1 is the research model and gives the entire hypothesis in this research.

4. Methodology

4.1. Questionnaire design

There are three items to measure social influence based on Duarte & Pinho (2019) [59], three items for habit based on Tamilmani et al. (2019) [60], three items for innovativeness based on Hwang (2021) [25], three items for perceived risk based on Zhu et al. (2016) [61], three items for knowledge based on Cai & Kang (2019) [62] and three items for usage based on Han et al. (2019) [63].

4.2. Sampling

Relevant guidelines and regulations were well performed in all procedures of this study. Ethics Committee of Henan University of Urban Construction has approved all experimental protocols, including those involving various ethical behaviors and any relevant details. Informed consent was obtained from all participating subjects and/or their legal guardians.

We cooperated with several of China's largest spirits flash delivery application service providers to distribute questionnaires in 3 cities in China with a population of more than 7 million. During delivering imported spirits, the courier show the consumer a QR code, and the consumer can participate in the questionnaire by scanning the QR code. When consumers complete the questionnaire, they receive an electronic coupon of movie. Couriers are paid based on the number of questionnaires sent.

4.3. Pilot-testing

In order to improve the reliability and validity of the questionnaire, we first conducted a survey on 46 consumers. Based on their feedback, we updated the old questionnaire and launched the official survey in April 2022.

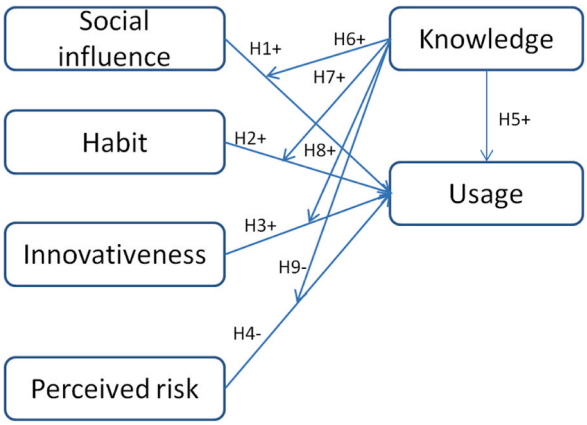

Fig. 1. Research model.

4.4. Data collection

A total of 362 completed questionnaires were received in 12 days with a completion of 51.8%. After invalid questionnaires are deleted, there are 315 valid ones for empirical test, which is shown in Table 3 in detail.

The advantage of Smart-PLS is that it is good at dealing with non-normally distributed data, small sample data, formative measurement models and single measurement indicators [64]. In addition, Smart-PLS also has unique output of results, such as internal consistency reliability, combined reliability, AVE and discriminant validity test. Therefore, it is reasonable to choose Smart-PLS 3.0 to test the research model. Sample demographic data, including yearly income, age, education level, gender, occupation and term of imported spirits delivery APPs, is given in Table 3.

5. Results

Before testing coefficient, reliability and validity of the research model should be considered. For reliability test, both composite reliability and Cronbach's αshould be higher than the threshold 0.7. For validity test, AVE values should be high than the threshold 0.6. Table 4 gives the detail information of the above tests. Heterotrait-Monotrait Ratio (HTMT) means ratio of between-trait and within-trait, which is used to test discriminant validity of the research model. Tables 5 and 6 give discriminant validity test progress. All values in Table 5 are less than threshold value 0.85, whereas all values in Table 6 are less than threshold value 1.0. Thus, discriminant validity test of research model is supported. When research model's validity and reliability are supported, the empirical test results are given in Fig. 2. In Fig. 2, H1, H2, H3, H4, H5, H7, H8 and H9 are all supported with related P values less than 0.05. Interestingly, although H6 is not supported, it is still negatively significant. This may be because when consumers have a more systematic knowledge of imported spirits, it is difficult for them to be influenced by advertisements and perceptions from the outside world. Moreover, as consumers' knowledge about imported spirits increases, they will form their own consumption habits, which may make consumers more rational in buying imported spirits rather than following advice from outsiders in APPs. Inexperienced consumers are more likely to be influenced by external advertising and recommendations, so it's useful to recommend them great ads and drinking methods. Conversely, for experienced consumers, reasonable prices and coupons may be an effective way to promote their use of apps. R^2 indicates the coefficient of determination, which reflects the proportion of the total variation of the dependent variable that can be explained by the independent variable through the regression relationship. In this research, R^2 value is 0.368, which indicates that the regression relationship can explain 36.8% of the variance in the dependent variable. Fig. 3 shows knowledge's moderating effect results in the research model.

6. Theoretical implications

As the consumption upgrade in the Chinese mainland market continues, the advantages of high-end, personalized and diversified taste of imported spirits are constantly attracting more consumers. Compared with traditional alcohol, if imported spirits brands want to further open up the Chinese consumer market, they need to continuously improve the awareness of the localized population, attract more consumers of different ages, and do a good job in differentiated brand marketing, so as to broaden the industry consumer market. UTAUT2 model related to mobile knowledge services, online transaction services and mobile health services have been the research

Table 3
Demographic statistics.

Category	Subject	N	%
Gender	Male	197	62.5%
	Female	118	37.5%
Education level	High school	77	24.4%
	Bachelor	192	60.9%
	Master	41	13.0%
	Ph.D.	5	1.7%
Age	20–30	203	64.4%
	31–40	70	22.2%
	41–50	33	10.4%
	More than 50	9	3.0%
Yearly income	<20,000$	61	19.3%
	20,000–50,000$	137	43.4%
	50,000–100,000$	94	29.8%
	>100,000$	23	7.5%
Term of using imported spirits delivery APPs	<3 months	82	26.0%
	3–6 months	105	33.3%
	6-12 months	62	19.6%
	>12 months	66	21.1%
Occupation	Civil servants	89	28.2%
	Professionals	84	26.7%
	Businessman	131	41.6%
	Others	11	3.5%

Table 4
Convergent validity, composite reliabilities testing results (SI social influence, H habit, I Innovativeness, PR perceived risk, K Knowledge, U usage).

Construct	Item	Standardized loading	AVE	Composite Reliability	Cronbach's α
Social Influence	SI1	0.962	0.933	0.968	0.965
	SI2	0.966			
	SI3	0.969			
Habit	H1	0.971	0.943	0.945	0.941
	H2	0.975			
	H3	0.967			
Innovativeness	I1	0.950	0.909	0.939	0.936
	I2	0.949			
	I3	0.961			
Perceived risk	PR1	0.899	0.849	0.947	0.942
	PR2	0.993			
	PR3	0.868			
Knowledge	K1	0.984	0.965	0.971	0.969
	K2	0.980			
	K3	0.983			
Usage	U1	0.974	0.950	0.969	0.967
	U2	0.978			
	U3	0.972			

Table 5
Discriminant validity (Heterotrait–Monotrait ratio) (SI social influence, H habit, I Innovativeness, PR perceived risk, K Knowledge, U usage).

	H	I	K*H	K*I	K	K*PR	K*SI	PR	SI	U
H										
I	0.222									
K*H	0.327	0.018								
K*I	0.016	0.543	0.087							
K	0.237	0.385	0.244	0.295						
K*PR	0.207	0.013	0.447	0.120	0.260					
K*SI	0.123	0.100	0.439	0.258	0.256	0.283				
PR	0.216	0.089	0.218	0.009	0.181	0.231	0.191			
SI	0.382	0.480	0.115	0.083	0.287	0.175	0.258	0.160		
U	0.301	0.350	0.011	0.049	0.294	0.236	0.147	0.048	0.470	

Table 6
Bootstrapping confidence interval up of HTMT (SI social influence, H habit, I Innovativeness, PR perceived risk, K Knowledge, U usage).

	2.5%	97.5%
H–U	0.026	0.267
I–U	0.083	0.384
K*H–U	0.036	0.244
K*I–U	0.042	0.246
K–U	0.035	0.293
K*PR-U	−0.216	0.003
K*SI–U	0.194	0.003
PR-U	−0.257	0.109
SI–U	0.093	0.371

hotspots in recent years. Emerging technologies such as 5G technology, VR technology, AI technology and the Internet of Things combined with UTAUT2 will show higher and higher application value. Imported spirits brands have been selling well in China in recent years, largely due to the high level of economic development of the Chinese mainland and the rapid acceptance of Western culture. However, the fundamental growth of imported spirits in recent years is the combination of growing alcohol consumers and information technology. The combination of convenient flash delivery service apps and the culture of imported spirits has contributed to the surge in sales of imported spirits. The results of this study show that UTAUT2 is an effective model for studying user acceptance behavior, which confirms the need to introduce new factors to improve the explanatory ability of UTAUT2 model.

7. Managerial implications

Social influence has a positive effect on usage, which means imported spirit delivery apps providers can open more direct-sale stores in China's small and medium-sized cities, expand publicity, and occupy an absolute sales advantage in these cities. Apps

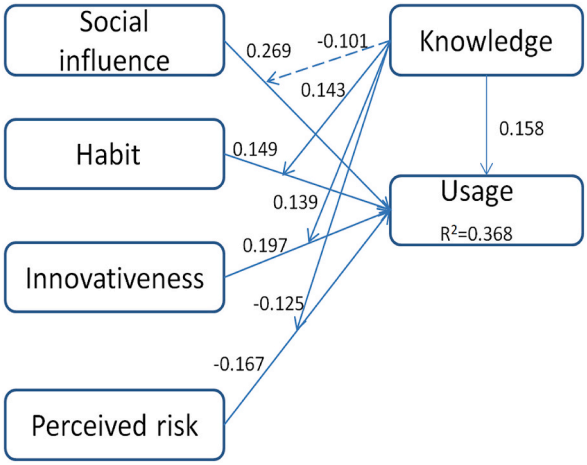

Fig. 2. Structural model ($P < 0.05$).

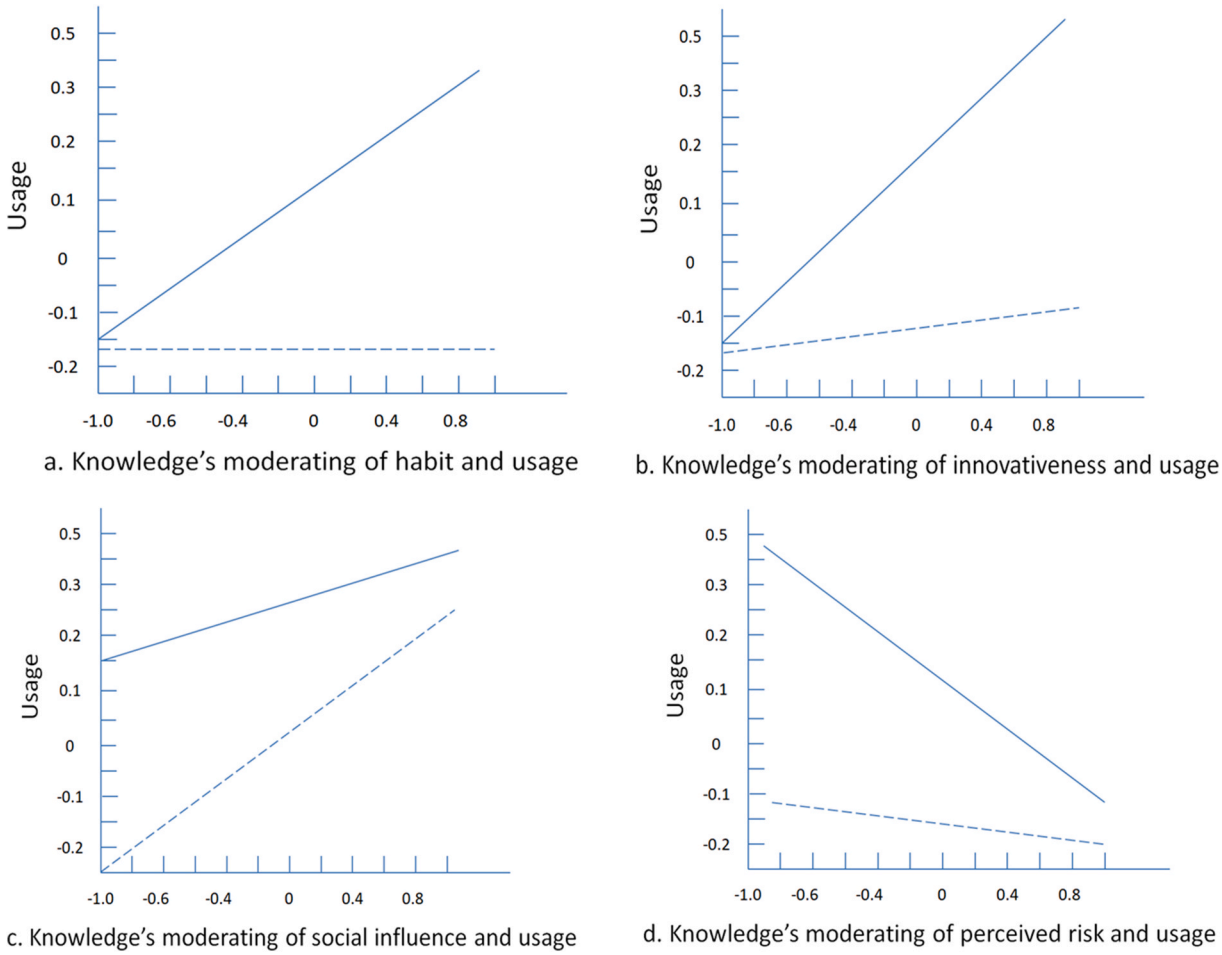

Fig. 3. Knowledge's moderating effects (Solid line for high knowledge, dashed line for low knowledge).

providers can link imported spirits with gourmet food, online games, Internet celebrities and successful people to increase its social influence among consumers. Innovativeness has a positive effect on usage, which indicates that apps providers should provide consumers with more innovative services to stimulate consumers' enthusiasm for innovation. Today's Chinese people are under a lot of

pressure from companies, families and government. If they drink some imported spirits in spare time, it will also be a good way to relieve stress. Apps providers could provide Chinese consumers with more advice on cocktail preparation and sell related accessories. The courier may also have the skills to demonstrate cocktail preparation, so as to stimulate the enthusiasm of consumers. Geo-location is a location-based application that enables continuous tracking of the geographic location of consumers using apps. APP developers can push preferential packages that meet consumers' consumption habits according to the geographical location where consumers often spend, and adapt to the most convenient couriers.

Habit has a positive effect on usage, which will inspire apps providers to teach Chinese consumers to enjoy imported spirits on different occasions. Service providers can cultivate professional spirits consultants in bars, music festivals, holidays and high-end restaurants in Chinese cities, and provide consumers with free tasting services. Apps providers can point out the advantages of imported spirits over traditional Chinese liquor in advertisements, such as culture, low alcohol and health content. All these efforts may promote the rapid formation of consumption habits. Perceived risk has a negative effect on usage, which tells that apps providers should work to reduce consumer suspicion of imported spirits. Imported spirits have multiple distributors, including foreign manufacturers, general agents in China, provincial agents, municipal agents and retailers. Each additional sales channel will lead to a slight increase in the price of imported spirits. Therefore, the price of imported spirits purchased by ordinary Chinese consumers is very high. Apps providers may strive to increase sales, so that they can bypass agents at all levels, directly connect with manufacturers, and get almost the best price. In order to reduce the risk of consumers buying fake products, apps providers can regularly invite consumer representatives to supervise warehouse purchases and select lucky ones to visit foreign spirits production plants. Apps providers can also reward consumers who buy fakes on other apps, and provide consumers with free imported spirits identification courses online. Apps providers should assure consumers that their privacy will not be abused.

Knowledge has a positive effect on usage, which proves the importance of building a culture of imported spirits consumption among Chinese consumers. Increasing Chinese consumers' understanding of the history and cultural heritage of imported spirits may greatly contribute to their enthusiasm for consumption. Apps providers can also use movie stars and Internet celebrities to promote the drinking methods and brand culture of imported spirits in film, television dramas and online live broadcasts. As for knowledge's moderating effects, it proves that when consumers' knowledge is high, innovativeness and habit are more significantly related to usage. Additionally, Fig. 3 also shows that consumers with low level knowledge will be more easily affected by social influence. The reason could be that consumers with low level knowledge are more likely to be attracted by advertisements and advice from opinion leaders. Therefore, apps providers can offer freer small-package products to consumers who rarely consume imported spirits, encourage them to try drinking and reward consumers who share their drinking experience on social media.

Findings of this study reflect the ambitions of imported spirits flash delivery service providers to increase spirits sales across China. This research helps to formulate optimized strategies together with offline imported spirits stores, official imported spirits websites, flash delivery service providers and retailers, including customer big data collection, order management, operation management, brand promotion and supply chain services. This study hopes to improve the competitiveness of imported spirits to challenge the market share of traditional Chinese liquor. This study also proves that the extended UTAUT2 can be used in various research objects [65–67].

8. Conclusions

Understanding consumer acceptance of information technology has become the latest research direction in the field of information systems. Currently, many theories already exist to explain consumer behavior, such as planned behavior theory (TPB), technology acceptance model (TAM), and push-pull theory (PPM). This study adds a new element to the UTAUT2 model, namely knowledge and innovation. The empirical results have supported the hypothesis and clarify the goals of the study research. Through long-term accumulation, imported spirits flash delivery service providers can accurately grasp key data such as preferences and tastes of various consumers. According to these data, suitable imported spirits can be pushed online for consumers. Since it is difficult for Chinese consumers to go to a large supermarket to buy their favorite imported spirits, the market for imported spirits flash delivery services will become larger. Imported spirits are one of the few imported products that the Chinese government does not have any restrictions on, so imported spirits flash delivery companies can cooperate with foreign spirits manufacturers to customize products more suitable for Chinese consumers, and use their own sale channel to quickly deliver them to Chinese consumers. Imported spirits not only have certain luxury attributes, but also symbolize the freedom and enthusiasm of western culture to some extent, so imported spirits manufacturers should pay more attention to the appearance and design of the packaging. Apps providers can recommend different cocktails, because random combination with soda, tea and coffee can greatly increase taste of spirits, which will share freedom, individuality and fashion with Chinese consumers in many online discussion communities such as Tik Tok, Kuaishou, and Xiaohongshu. These are traditional Chinese liquor cannot offer. In the digital age, consuming big data accumulation of new retail of online and offline will provide a practical basis for the decision-making of flash delivery companies, therefore the imported spirits sales industry is undergoing tremendous changes and the competitive environment will be greatly improved.

9. Limitations and future research directions

In spite of all the contribution of this study, some limitations exist. First, imported wine delivery is not included in the scope of this study due to its different pricing strategies and consumer groups. Future research could compare Chinese consumers' different views on imported wine and spirits flash delivery service. Second, since traditional Chinese liquor still occupies the majority of the market share in China, future research can explore the different satisfaction of consumers with traditional liquor and imported spirits to find

out the factors that improve the competitiveness of imported spirits flash delivery service. Third, future studies may compare the behavior of different generations of consumers in relation to the decision to purchase imported spirits. Fourth, there is an opportunity to analyze the expansion of sales channels for imported spirits as a competitive element. Fifth, it could be useful to compare the effect of communities such as Tik Tok, Kuaishou, and Xiaohongshu on the decision to purchase imported spirits in the Chinese market. Finally, this questionnaire is mainly aimed at Chinese consumers. Future research can compare the acceptance of imported spirits from different developing countries, so as to find out the marketing strategies suitable for developing countries.

Author contribution statement

Dr. Wei Sun: Wrote the paper.
Dr. Ho Young Shin: Analyzed and interpreted the data;
Pro. Haiyan Wu: Conceived and designed the analysis; Xue Chang: Contributed analysis tools or data.

Data availability statement

Data included in article/supp. material/referenced in article.

Declaration of competing interest

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 paper.

Appendix A. Supplementary data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.heliyon.2023.e16346.

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