



# Research on the Multidimensional and Sustainable Design Strategy of Streaming Media Under the Integration of User Experience and Perceptive Technology in Greater Bay Area

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**Abstract.** First of all, Guangdong, Hong Kong, Macao and the Greater Bay Area streaming media business as a variety of national policies under the strong support to complete the initial development, and harvest the “streaming media night city” reputation, but the surface of the traffic growth does not represent its growth path is smooth, in COVID-19 is the emergence of many difficult to break through the obstacles. The market for streaming media is limited in scope, and the cost of acquiring new users is getting higher and higher. The operators in the Greater Bay Area are not deeply involved in the application of behavioral and perceptual computing technologies, and the traditional operation strategy is missing a series of measures that can effectively wake up high precision, which becomes the biggest threat to the sustainable operation strategy. Therefore, this paper takes the integration of computational experience technologies to guide users’ return opportunities as the starting point, based on the Re-domestication framework and through powerful experiments to uncover the value, perception and real behavior of re-use experienced by users during the churn period. Meanwhile, this paper investigated the awareness, experiences and attitudes of 785 streaming media users in the Greater Bay Area about re-domestication by using a structured questionnaire in three dimensions: Media, Human, and Context. Analysis was conducted to refine, analyze and model the important variables. The results of the study showed that the variables H2c Business Plasticity, H4c Social Identity, H3a Spiritual Pursuit, H3c Self-Actualization and H2b Social Urgency are the key factors for user return, and we also analyzed and integrated these variables based on personal opinions. We also analyze and integrate these variables based on our personal views. Finally, we build a new “computer technology + streaming media operation” model based on the perspective of user experience design and technology for different platform sizes, social, economic, cultural and technological. On the theoretical level, this study breaks the gap between horizontal interpretability and vertical empirical evidence; on the practical level, it establishes a sustainable design direction for streaming media designers with technology integration as the main focus, and brings a new operational vision for streaming media platforms that can break

through the white-hot competition of enterprises and capture the market brought by the revolution of big data technology.

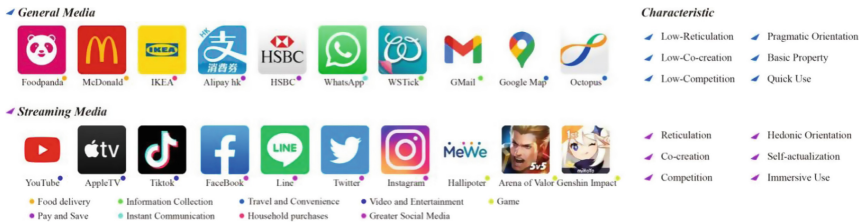
**Keywords:** Component · Streaming Media · User Return · Design Technology and Strategy · Domestication Theory · Sustainable Operation · User Experience and Perception

## 1 Introduction

Streaming media is a sign of the industrial society of collectivization turning into a society of individualized information, which refers to new technology and path for the segmented transmission of data-compressed multimedia from the producer to the user through the World Wide Web. Since then, the way humans obtain information had a huge change. The biggest feature of streaming media is “streaming” transmission, that is, real-time and interactive information flow distribution. With the development of media technology, there is no need to worry about the caching process and system capacity caused by asynchronous transmission, packet decomposition, and routing in traditional information transmission during information reception. For the producer, this enables the content to be output without conversion, and for the receiver, it can also be viewed without being downloaded.

As one of the four major bay areas in the world, the Guangdong-Hong Kong-Macao Greater Bay Area has a very high degree of opening up and economic potential. Therefore, in the past 10 years, the “cultural weakness” has been gradually reduced. The “siphon effect” is a phenomenon in which a core city goes through the middle stage of industrialization and completes mature development, attracting a high concentration of peri-urban population due to high-quality medical, education, and infrastructure resources. In the past 10 years, in the process of regional integration supported by the state, the Pearl River Delta region has attracted a population inflow of 17.66 million people due to its advantages such as convenient transportation, industrial clusters, and favorable policies [24]. The Hong Kong SAR, which has a clearer system of internationalization rules, as a node of internal and external circulation, has attracted a large influx of international and high-quality talents through effective measures in the third opening up [39], such as the Admission Scheme for Mainland Talents and Professionals (ASMTF) [17].

Therefore, in the continuous development and changes of the Greater Bay Area, by gathering a large number of accurate and younger user groups of streaming media audiences, it has gradually become the area in China with the most attention and influence on the Internet. “Guangdong-Hong Kong-Macao Greater Bay Area on Douyin” also pointed out that Guangzhou’s user base, content production, and views far exceed those of other major domestic cities. In June, the peak number of views in its 17 districts was as high as 15.6 billion. Moreover, by measuring the spread, influence, recommendation, favorability, and attraction of streaming media content in the Greater Bay Area, it is concluded that it has become a “streaming media city that never sleeps” due to its online prosperity at night [32]. As far as the coverage of streaming media software is concerned, Hong Kong occupies a high share of 86.9%, 83.0%, and 59.1% respectively



**Fig. 1.** Comparison between mainstream streaming media and ordinary media in Greater Bay Area.

in large international streaming media such as YouTube, Facebook, and Instagram [16]. Meanwhile, the development of streaming media is full of challenges, especially the problem of user return and loss, which needs the support of continuous innovation and changing market strategies. In this regard, this article will start from the streaming media market in the Greater Bay Area, and extract strategies through empirical research to come up with a sustainable operation strategy that is truly suitable for the local area (Fig. 1).

## 2 Sustainable Operation Crisis of Streaming Media in the Greater Bay Area

In the Internet 1.0 era, based on the strong demand of users in the Bay Area, professional and technical personnel found an iterative breakthrough in mobile communication from various aspects, creating higher information transmission speed and network throughput. Communication products originally based on the point-to-point design concept on the market, such as Internet radio, news releases, and MP3, having undergone generalization, facilitation, localization, and mobile software and hardware upgrades in the Internet 2.0 era under the mesh and three-dimensional communication strategy [5], experienced rapid expansion and gave birth to a large number of streaming media products, such as short video, online shopping, matchmaking, and mobile games. Users can independently produce creative content in a decentralized, low-threshold streaming media platform and share it with other users on the “net”, creating a higher plastic and flexible use-value for this hedonic mode. Therefore, in the Internet 3.0 era, streaming media in the Greater Bay Area has gained explosive growth in traffic, but it does not mean that it can make long-term sustainable profits. We believe that it is still facing the following crises:

### 2.1 Technical Defects at the Streaming Media Level

The streaming media platform itself has technical flaws. First of all, the limited bearing technologies are gradually unable to meet the explosive production of content. It is known that during the epidemic, many network service providers experienced network congestion, telecommunication failures, and reduced content quality, which greatly disrupted users’ hedonic experience [14]. Secondly, the overuse of recommendation algorithms would lead users to fall into the “information cocoon”. The convenience and intelligence of the algorithm gradually reduce their desire to actively explore the content of interest;

meanwhile, the threshold for perception of the original happy content will also be raised [28]. Finally, there is also a lot of competition among streaming media platforms, and the hedonic strategy cannot fulfill all the needs for individuation and flexibility. Users will actively migrate and switch hedonic platforms. After long-term, excessive, and repeated contact with the same platform, the difficulty of emotional arousal gradually increases, which leads to usage transfer [35].

## 2.2 Confusion at the User Level

Users are prone to inadvertently fall into use burnout, and then give up use. From the perspective of user psychology, moderate streaming media enjoyment is a state of flow that can improve production motivation, social well-being, and happiness. In this challenging process with real-time feedback and a sense of control, the user not only has a clear goal of relaxation and can feel the change in the concept of time but also find a sense of balance and control between hedonic acceptance and enjoyment. At the user's physiological level, immersive multimedia entertainment can effectively trigger the secretion of the addiction-related chemical dopamine at the junction of the midbrain and diencephalon, which induces the user to continue to engage in the entertainment process [6]. From the perspective of long-term use, the use and satisfaction theory and the continuous use model believe that the user's next use desire is strongly related to the previous use evaluation, and is constantly in a cumulative state [29]. Pleasure has a moderate range, and once the user breaks this virtuous cycle of use, a cognitive conflict arises between nascent burnout and the desire to use. Continued enjoyment means enduring negative emotions and the physical response of fatigue. Negative use refers to the inability to focus on hedonic content and distraction [18], which is accompanied by emotions such as guilt, boredom, emptiness, and fatigue, and the users gradually readjust the balance of life through behaviors such as uninstallation, resistance, and avoidance.

## 2.3 Uncontrollable Use of Context

The market environment of streaming media and the needs of users are often uncontrollable. From the analysis of the overall streaming media market environment, ecological streaming media already has supply chain attributes. The unpredictable impact of the Covid-19 epidemic may have increased the use of mid-end streaming media, but it strongly affected the upstream and downstream economic activities in the supply chain [14]. For instance, in live-streaming e-commerce, the production efficiency of manufactured products at the front end and the back end of the supply chain is reduced, the turnover of the front-end joint investors is poor, and even the live broadcast itself is facing difficulties. From the perspective of user needs, users will withdraw from use due to limited and unchangeable conditions of use. Many user churns completed qualitatively show that changes in work, learning environment, family, and social cognition always cause people's forced or passive behavior.

The consequence of these crises is the rupture of the continuous use relationship between users and streaming media, resulting in long-term use interruption and threatening the sustainable operation of streaming media.

### 3 Research Motivation

#### 3.1 The Thorny Research Problems

For the mature international streaming media market seeking sustainable development, the unsustainable operation has always been a difficult problem to solve. According to the <US Major SVOD Monthly Churn Rate> published by Antenna, aside from streaming giants such as Netflix, Apple TV experienced an astonishing 16% user churn rate in April 2021, and the average churn rate of other large SVOD streaming companies continues to increase [1]. For the emerging Greater Bay Area market with a late streaming media market, it lacks countermeasures to solve the problem of unsustainable use. Although Douyin, with a 60.7% share of streaming media in Guangdong, has steadily reached 512 million users from its birth to 2020, it saw a gradual decrease in its users. Kuaishou and Watermelon Video have also experienced similar situations [25]. Apart from long-term data, Douyin also has a short-term “cliff-style” loss of users. It is known that Douyin’s user activity used to drop by more than 40% within half a month, and it was even ridiculed by analysts in the industry as “Is Douyin trembling (dou in Chinese)?” [20]. The Greater Bay Area has an accurate and high-quality initial market with great potential. Although streaming media platforms have reaped initial profits here, solutions to unsustainable problems need to be sought before the development of streaming media turns white-hot. If they were not solved, the lost profits would be incalculable. Therefore, it is very important to solve the problems from the perspective of the user.

#### 3.2 The Vacancy of Prior Research

Users are prone to inadvertently fall into use burnout, and then give up use. From the perspective of user psychology, moderate streaming media enjoyment is a state of flow that can improve production motivation, social well-being, and happiness [26]. In this challenging process with real-time feedback and a sense of control, the user not only has a clear goal of relaxation and can feel the change in the concept of time but also find a sense of balance and control between hedonic acceptance and enjoyment. At the user’s physiological level, immersive multimedia entertainment can effectively trigger the secretion of the addiction-related chemical dopamine at the junction of the midbrain and diencephalon, which induces the user to continue to engage in the entertainment process [6]. From the perspective of long-term use, the use and satisfaction theory and the continuous use model believe that the user’s next use desire is strongly related to the previous use evaluation, and is constantly in a cumulative state [29]. Pleasure has a moderate range, and once the user breaks this virtuous cycle of use, a cognitive conflict arises between nascent burnout and the desire to use. Continued enjoyment means enduring negative emotions and the physical response of fatigue. Negative use refers to the inability to focus on hedonic content and distraction [18], which is accompanied by emotions such as guilt, boredom, emptiness, and fatigue, and the users gradually readjust the balance of life through behaviors such as uninstallation, resistance, and avoidance.

### 3.3 Uncontrollable Use of Context

Different disciplines or fields have different theories and models for the phenomenon of user sustainable use, and most of them focus on the explanation and enhancement of the sticky interaction between streaming media and users, such as Use and Gratification (U&G) [19], Expectation-Confirmation Theory (ECT) [27] and Technology Acceptance Model (TAM) [7]. Based on these models, sustainable marketing researchers continue to make improvements through empirical research, but they have not paid attention to the psychological state of users in the abandonment stage or their desire to use again. Fortunately, we found the Domestication Theory proposed by Silverstone. R. fill this gap (Fig. 2).

Domestication Theory focuses on explaining the process of people constantly adapting to new technologies and incorporating them into life and production in an information society [30]. Originally, domestication-related research only focused on the materiality and meaning of emerging consumer goods in the family context as well as ways of improving users' social identity. However, due to its scalability and openness [10], it was later extended to a variety of consumer contexts and products such as fiber-optic broadband in the Nordic society, digital games, e-government, etc. [11], which gradually proves the importance of "involving users in design" and "focusing on the entire process of media acceptance". Silverstone. R., the proposer, admits that the Domestication Theory has planarity defects in the process in his later years [31], and scholars have continued his unfinished work in the new media environment in recent years [9, 15]. They improved it into "Re-domestication", believing that the process of Domestication in the new media era should be dynamic, dialectical, and iterative. Based on the improved Re-domestication, Huang, Y. gained insight into the cyclical process of the [use-abandon-reuse] of the Moment function by users of the "super app WeChat" in the special Chinese human society. She found that after users withdrew from use, they re-experienced the 4 major steps of Re-appropriation, Re-objectification, Re-incorporation, and Re-conversion at the time of initial use through reflection and adjustment of time and space, relocating the Moment function to a more reasonable life situation and gaining

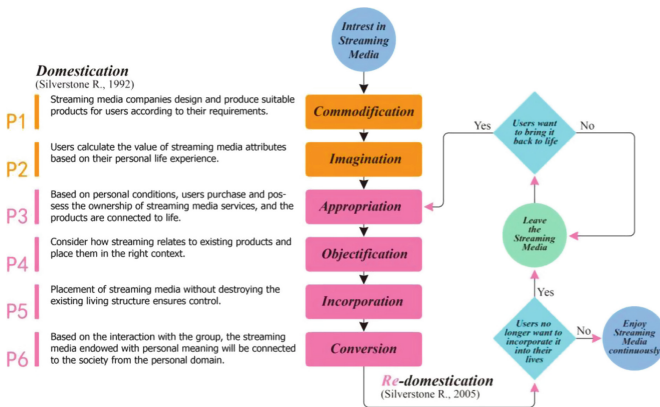


Fig. 2. The usage of Streaming media in Domestication and Re-domestication theory.

happiness. Also, they inspired a regular and fluctuating user sustainable management model for media platforms. However, “Domestication” and “Re-domestication” have not attracted much attention from Chinese scholars, let alone being extended to the field of streaming media, so we think they could be extended deeply in the future.

### 3.4 Research Questions and Variables

In most of the studies on the sustainable operation of streaming media, the researchers focus on the relevant factors of user loss while ignoring the thinking of “user return”. In this regard, we will focus on the discussion: “What are the factors that contribute to the return of users in the Greater Bay Area?”.

To measure the factors that affect user return, we refer to the framework of Re-domestication theory, though there are some deficiencies in it. We have learned some latent variables through flexible informal interviews in colleges and universities in the Greater Bay Area. Also, we consult some media studies [8, 15, 18, 35] and summarize the independent variable (IV) that has three dimensions: Media, Human, and Context.

In an informal interview, a 24-year-old female student from the Hong Kong Polytechnic University told us, “Although Douyin is addictive, I am willing to be addicted. The last time I returned to Douyin was because my boyfriend was using it, so...” And two male students in the same class said that they would always redownload MoMo late at night because they received text messages such as “There is a girl nearby 0.6 km who is interested in you”. In addition, we also communicated with 2 college teachers in the Pearl River Delta region, who said that their use of streaming media had increased significantly during the COVID-19 epidemic, and one of them even said, “I can’t live without Douyin and Bilibili, because they are the only way to relieve pressure.”

The Commodification (P1) stage of Re-domestication shows that the design and applicability of media products are the primary factors to attract users to purchase. Meanwhile, the Imagination (P2) stage demonstrates that these functions need to be evaluated, taking into account the user’s personal life to decide whether to buy or not. Therefore, it is necessary to consider the factors related to user return from the perspective of the media platform. From the perspective of Media, we speculate that the design process of the Greater Bay Area streaming media platforms makes full use of the powerful information flow recommendation, social system, fragmented streaming service, as well as strongly plastic and emotional business means [36] so that they are capable of capturing the use-value evaluation of modern audiences, and attracting users to return from the root. Having considered the Re-domestication theory P1 and P2, we set the Media variable group.

The Appropriation (P3) stage of Re-domestication indicates that users will repurchase products driven by their emotional attributes. Given the product design advantages of streaming media we stated above, we speculate that users will establish a sticky relationship with streaming media in continuous use, and even form a dependence that cannot be erased even if they quit using it. Moreover, Conversion (P6) also exhibits that people use the media because media bring about social identities and symbols. Therefore, this kind of platform that can provide users with [reality-virtual] role transformation and self-presentation will attract a large number of users with strong resonance and hedonic

depth to return. Having considered the P3 and P6 stages of the Re-domestication theory, we set the Human variable group.

The Objectification (P4) and Incorporation (P5) stages of Re-domestication explain the possibility of streaming media reconnecting to life from the perspective of usage scenarios, and we speculate from interviews that users will reduce their use of streaming media due to changes in education and work. Meanwhile, due to the depression and work pressure caused by COVID-19, they choose to put it back into use in a suitable environment. Therefore, we designed a Context variable group. At last, we designed a dependent variable (DV) Condition group to test whether users have reusing experiences and emotional transformation, which helps us to explore the relationship between independent variables and the reflux phenomenon.

## 4 Research Hypotheses

Based on the research variables designed above, we propose the following research hypotheses:

H1) There is a phenomenon of re-domestication among streaming media users in the Greater Bay Area. After giving up use due to negative emotions, users will readjust themselves and reuse comfortable products due to certain factors.

H2) At the streaming media level, certain factors have a positive and significant relationship with users' willingness to return.

H3) From the user perspective, there is a positive and significant relationship between certain factors and users' willingness to return.

H4) From the context perspective, there is a positive and significant relationship between certain factors and users' willingness to return.

H5) Viewed from the overall user return process, the independent variables of H2a, H2b, H2c, H3a, H3b, H3c, H4a, H4b, and H4c act as mediating variables in the whole process.

## 5 Experimental Method

In this part of the experimental method, we need to deeply understand users' experience of churn and return, that is, the process of re-taming streaming media by continuously adjusting personal attributes. Therefore, we chose the questionnaire method.

### 5.1 Method Selection

We will use a questionnaire to complete this research. First, the long-term, horizontal, and quantitative use of log big data is too complex and difficult to judge the classification standards, while the scale of qualitative interview data is too small to support the mining of variable relationships. Second, for the research related to domestication theory, it is necessary to obtain first-hand information on returning behavior and intention perception in the context, which is mostly done in qualitative form, while the form of questionnaire is more narrative, concise and flexible.



## 5.2 Questionnaire Content Design

We designed the <Survey on the Experience of Using Streaming Media in the Greater Bay Area> for this purpose. First of all, it contains a total of 6 questions for the demographic information survey (Age, Gender, Education Level, etc.) (Q1–Q5) to help us understand the basic information of users. Second, we set up 3 questions (Q25–Q27) about whether the user has the experience of [abandoning-not using-reusing] as the dependent variable (DV). Furthermore, we set up 1 question (Q24) concerning user sentiment change, 6 questions (Q6–Q11), 6 questions (Q12–Q17), and 6 questions (Q18–Q23) based on the characteristics of the media, the user himself, and the communication context, they act as independent variables (IV) and Mediators(M). Finally, these questions are designed and organized in a reasonable language and correspond to the research hypotheses and variables. Please refer to the variable table for details.

## 5.3 Recording Standards

This study uses the Likert 6-point scale which is in line with the demographic characteristics of the Greater Bay Area for feedback mechanism design. Although the Likert scale is the mainstream scale of the answering mechanism, its scale design is controversial, especially the “golden mean” thought in traditional Chinese culture that may easily trigger the “effect of being neutral” and conceals the respondents’ true intentions. The selection of scales depends more on the research purpose. Too many levels would result in respondents’ fatigue and reduce answering efficiency. A scale controversy from Macau (Greater Bay Area) shows that only the 6-point and 11-point scales conform to the normal distribution of Kolmogorov-Smirnov and Shapiro-Wilk statistics [22], which has been verified by subsequent scholars, so this study will continue to use the 6-point scale.

## 5.4 Questionnaire Delivery and Collection

Finally, after the digital design and beautification of Questionnaire Star, the questionnaires are distributed to the Greater Bay Area community in the form of snowball sampling, that is, the members of the research team distribute it to their friends and groups in the Greater Bay Area on Wechat, and then their friends continue to distribute questionnaires and collect answers in their circle of friends or WeChat group chat. At the same time, to further understand the attitudes of young user groups, we especially invite some college staff to distribute questionnaires to their students, the colleges, and universities including Guangdong Innovative Technical College (GITC), The Hong Kong Polytechnic University (PolyU), Beijing Normal University - Hong Kong Baptist University United International College (UIC), and Macau University of Science and Technology (MUST).

According to the ratio of the service industry in the Greater Bay Area to the total GDP, a total of 575 questionnaires were distributed in the developed Pearl River Delta regions of Guangdong (Shenzhen, Guangzhou, Dongguan, Foshan), 125 in Hong Kong, and 85 in Macau (Greater bay area., 2022). A total of 785 questionnaires were distributed in this project, and 731 valid questionnaires were collected, with an effective rate of 93.1%.

Among the respondents, 50.7% were male, and 70.4% of the respondents had a college degree or above, among which office workers and students were the most surveyed groups, accounting for 48.2% and 27.9% respectively. The results of this survey show a prevalence of these two groups, mainly because the interpersonal relationships of the members of the survey team have are mainly with college students, teachers, and enterprises and institutions that they used to or currently work in.

## 6 Experimental Analysis

### 6.1 Reliability and Validity

The questionnaire data analysis of this study was conducted using IBM SPSS Statistics 23. The reliability of this survey questionnaire is good. A total of 731 samples (N) were collected and the effective rate of questionnaire fill out was 93.1%. The reliability of the Cronbach Alpha coefficient test was 0.919. If the non-modeling analysis part of the demography group was excluded, the Alpha coefficient is as high as .944.

The validity of the questionnaire is good. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) coefficient in exploratory factor analysis is .975, which is close to 1, so the questionnaire has good structural validity. In addition, the Sig. of Bartlett's Test of Sphericity is less than 0.05, which also indicates that the questionnaire has a good structure.

The data in this study were normally distributed and rich in structure. The mean and standard deviation of each item are evenly distributed, with an average overall mean of 2.66 and a standard deviation of 1.378. The basic Z-score, Skewness, and Kurtosis can be used to measure whether the research data is normally distributed. Descriptive statistics show that MeanSkewness  $\approx 0.676$  (Std. Error  $\approx .09$ )  $\approx 0.676$  (Std. Error  $\approx .09$ ), so  $Z_{scoreSkewness} = 0.676/0.09 \approx 7.51$ . And MeanKurtosis  $\approx -0.314$  (Std. Error  $\approx .181$ ), so  $Z_{scoreSkewness} = -0.314/.181 \approx 1.734$ . The MeanSkewness and MeanKurtosis of this study are both  $\approx 0$ , and the Zscore of Skewness is between  $\pm 1.96$ . The research data conform to the normal distribution, and the data distribution is squat (MeanKurtosis  $< 0$ ) and positively skewed (MeanSkewness  $> 0$ ). Additionally, it can also be concluded that Q16 (Std  $\approx 1.492$ ), Q24 (Std  $\approx 1.481$ ), and Q22 (Std  $\approx 1.471$ ) are the three most controversial questions, Q14 (Std  $\approx 1.303$ ), Q10 (Std  $\approx 1.316$ ) and Q19 (Std  $\approx 1.323$ ) is the least three controversial questions, and the numerical difference of Std. is not large, so the user responses show a certain consensus (Table 3. Descriptive Analysis). Therefore, this questionnaire has achieved good analyzability through structured, rigorous design and reasonable delivery.

### 6.2 Hierarchical Regression

Hierarchical Regression can help researchers discover nested structures in variables, which is one of the two ways to determine the "best" predictor. It mainly uses step-by-step "Block" input to assist researchers to gain insight into the various groups that can significantly improve model performance and exclude groups with lower performance [21]. To test the analyzability of the independent variable groups (Demography, Media,

**Table 1.** Model Summary and ANOVA of Hierarchical Regression.

Model Summary and ANOVA of Hierarchical Regression								
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	Mean Square of regression	F	Sig.
a	.660	.004	.003	1.08425	–	3.804	3.236	.072
b	.801	.641	.640	.65146	–	275.925	650.160	.000
c	.844	.712	.711	.58410	–	204.261	598.709	.000
d	.851	.725	.723	.57125	1.958	155.974	477.962	.000

a. Predictors: (Constant), Demography, b. Predictors: (Constant), Demography, Media, c. Predictors: (Constant), Demography, Media, Human, d. Predictors: (Constant), Demography, Media, Human, Context, e. Dependent Variable: Re-domestication Predictors

Human, Context) in this study under the relationship with the dependent variable Re-use (makeup from Q25, Q26), and to select the most important variables, Hierarchical Regression would be utilized. We constructed 4 predictors, with the first layer - independent variable a being a demographic variable. The second layer b adds the Media variable group based on the first layer a, and accumulates them in turn to obtain the independent variable groups (a, b, c, d) and the dependent variable group (e).

Through the analysis, it can be known that the significance of the model a  $p > 0.005$ ; so the availability is low, and the statistical significance is low. Followed by R Square = 0.004, Adjusted R square is only 0.003, Std. The error of the Estimate  $> 1.00$ , so it is proved that the data interpretability of this layer is poor, which can be directly eliminated from the Demography model. Therefore, in the following research, the user’s basic information will not be used for correlation model judgment. The R Square of the final model d is 0.725, and models of different levels have significant changes in R square in stacking, which is statistically significant. We will continue to use Media(b), Human(c), Context(d), the three major variable groups for the following analysis (Table 1).

**6.3 Correlations Analysis**

Correlation analysis can help us explore the relationship and properties of variables to test hypotheses. Since our data generally conforms to a normal distribution, we use the Pearson correlation analysis method for variable correlation and corresponding significance test. After SPSS outputs the chart, we convert it into a correlation structure chart (Table 6. Correlations Analysis).

First, we test H1. There is a strong correlation of  $0.619^{**}(p < 0.01, Sig. = 0.000)$  between Interruption (Q25) and Reuse (Q26). And there is a correlation of  $0.506^{**}(p < 0.01, Sig. = 0.000)$  between Negative Emotion (Q24) and Positive Emotion (Q27). Therefore, we can conclude that most of the users in this study have the phenomenon of giving up streaming media and then using it again. In addition, more than half of

the users adjusted themselves to adapt to a new round of product use driven by certain factors during the abandonment period. They were more prone to active use after the return. So H1 holds.

Then, we test H2, H3, and H4. We need to understand whether there are factors related to the Backflow Process of [Interruption-Reuse] from the perspective of H2 Media, H3 Human, and H4 Context, and dig out the variables with strong correlation. Through research, we know that H2 Media, H3 Human, and H4 Context have a significant positive correlation of 0.801\*\* ( $p < 0.01$ ), 0.808\*\* ( $p < 0.01$ ), and 0.778\*\* ( $p < 0.01$ ) with Backflow Process respectively, so there is a strong correlation. Additionally, each segment variable (H2a, H2b, H2c, H3a, etc.) has a strong and significant positive correlation with their corresponding parent variables, except for the general correlation of H4b. Therefore, it is assumed that H2 (H2a Functional Superiority, H2b Social Urgency, H2c Business Plasticity), H3 (H3a Spiritual Pursuit, H3b Use Dependence, H3c Self-actualization), H4 (H4a Social Atmosphere, H4b Operating Environment, H4c Social Identity) are all established.

#### 6.4 Mediation Analysis

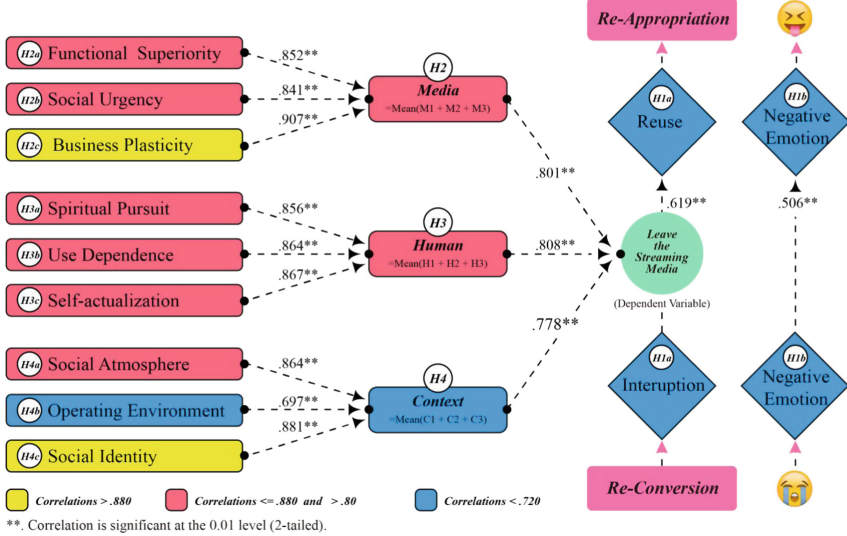
Mediation Analysis is a causal concept that transmits the influence of independent variables on dependent variables as an intermediary, namely  $X \rightarrow M \rightarrow Y$  [3]. Based on Correlation Analysis and comprehensively using this method, we can directly and precisely understand the factors that potentially affect users from churn to return. Therefore, we install the Hayes Process plugin in SPSS and use Model 4 [12], which can calculate the Indirect effect of X (Interruption) on Y (Reuse) and the Direct effect of X by  $M_i = a_i b_i$  on  $Y = c'$  to find the best Mediator, so during the experiment we test the Mediator ( $M_i$ ) (H2a, H2b, H2c, H3a, H3b, H3c, H4a, H4b, H4c).

First, the author tests the correlation between the independent variable X and the dependent variable Y, and the R Square is 0.6193 and 0.3835 ( $p < 0.005$ ) respectively, which are in line with the results of Correlations. Secondly, after testing, it can be concluded that except for the mediating variable H4b Operating Environment's R Square = 0.2278, other mediating variables are all greater than 0.35, which are mediating variables with high availability in social science analysis. The correlation between the mediating variable M and the dependent variable Y is generally not high, and the significant p is less than 0.005 only in H3a, H3c, H4c, so the author includes these three mediating variables as the key analysis objects. Finally, the author calculates the Indirect Effect of X on Y, and obtains the direct effect of each mediating variable = 0.4587, accounting for 81.88% of the total influence coefficient. After calculation, it is known that there are a total of 5 mediating variables accounting for > 10.00%, which are H2a, H2c, H3a, H3c, H4c respectively. The intermediary variables with the highest proportion are H2a Spiritual Pursuit (17.63%) ( $p < 0.005$ ) and H4c Social Identity (15.78%) ( $p < 0.005$ ), which also have the highest analytical significance. Based on these analyses, we can conclude that hypothesis H5 holds, although there are some variables with low mediation, which will be eliminated directly in the later analysis. At this point, the new Re-domestication has been constructed (Figs. 3 and 4).

**Correlations Research**

<A survey on the use of streaming media in the Greater Bay Area>

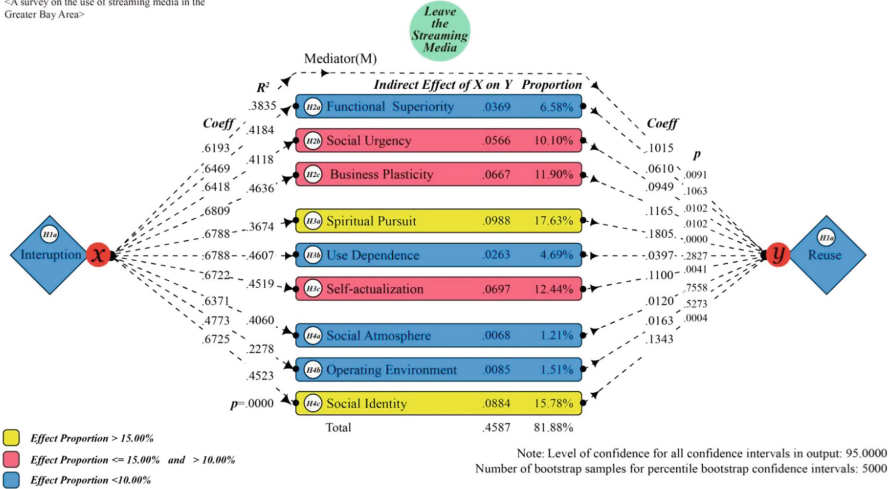
**Re-domestication**  
(Silverstone R., 2005)



**Fig. 3.** Correlations Analysis.

**Mediation Analysis**

<A survey on the use of streaming media in the Greater Bay Area>



**Fig. 4.** Mediation Analysis.

## 7 Experimental Results and Strategy Discussion

In this part, the author will propose some new sustainable operation design strategies for streaming media based on the experimental results and the new Re-domestication model. Contemporary designers and researchers have made a lot of efforts to create a

positive, aesthetic, and dynamic hedonic process for users, and they have also taken a series of measures to solve user addiction and loss in terms of sustainable use, such as: persuading users to stop over-enjoying Youtube by implanting a visual gradient layer in the viewing area [23], making personal digital health known to users through data visualization in ScreenTime to limit usage [2], and using the Multitasking concept to guide users to turn to other cooperative applications to avoid passive use when they are burnt out with a single media [33]. It is impossible to deny the actual effect of the design strategy concerning solving “user churn”, however, we have also drawn some new strategies from another angle in the above experiment of guiding users to return. Even if all the above assumptions are true, we still find that there are some highly correlated and mediating variables in our updated Re-domestication model, and we also include them in the strategy below for discussion.

### **7.1 Commerce-Oriented Strategies**

Designers take commercial measures that are full of warmth. The corresponding questions of H2c Business Plasticity are Q10 and Q11, and the results show that the business strategy used by streaming media for user return is effective. At present, most streaming media usually require the user to enter phone number information when the user begins his first use, and they would actively contact the user in other forms after the user quits using it for some timesome time. Soul is a young and anonymous dating platform. It uses the form of “avatars” to help users collect information streams in the media that can establish social relationships during the period of user loss, and when the users’ daily emotional desire reaches the peak, it would push notifications to the users in the form of SMS. “[Soul] Ke\*\*ng, a girl in Hong Kong left you a private message, you must go back to Soul to check what she said. If it expires, you will be rejected Time: 11: 31pm 12-12-2021”.

Other studies have also shown that the Emotional attachments (EA) of adolescents in this platform are more likely to contribute to Perceived Usefulness (PU) [37], so Soul’s use of some inductive words in the Appropriation (P3) stage to guide them back is effective. What is more, some other video media such as Baidu Netdisk, JOOX, iQiyi, etc. regularly launch attractive membership subscription plans or link with other products online and offline to attract users to build relationships with them again. Furthermore, for shopping streaming media, the well-known Pinduoduo would exchange user data resources with other platforms to induce users to return to use in the way of “use transfer”. Therefore, these warm measures are effective, and designers should take them into full consideration; also, they should focus on developing new measures to break through the homogeneous competition.

### **7.2 Culture-Oriented Strategies**

Designers should pay attention to the cultural attributes of streaming media. The corresponding questions of H3a Spiritual Pursuit and H3c Self-Actualization are Q12, Q13, and Q16, Q17. The results show that the return of users will be affected by instinctual spiritual pursuit and self-presentation. On the one hand, designers need to embed culture into content attributes, pay full attention to the co-creation management of the platform

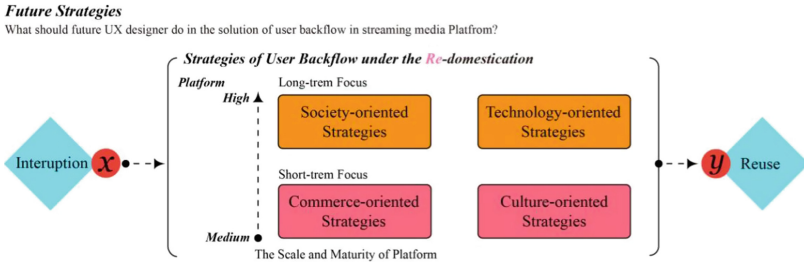
and the cultural connotation of the Greater Bay Area, and make the content grounded and attract users to return with a sense of affinity. On the other hand, designers need to implant culture into brand attributes. Brand culture is a powerful tool for sustainable operation, and a brand image that conforms to users' aesthetics and values can better meet the needs of users for virtual identity, social identity, and self-presentation. Brand image is not limited to visual image communication, and designers need to understand user preferences from multiple dimensions to build a consistent, coherent, and fluid brand culture system. When performing these tasks, designers should fully grasp the methodology and innovative knowledge and tools, such as the [iteration-test-re-landing] work wheel, Product life cycle (PLC) model, user portraits, etc., using empathy to gain insight into more users' spiritual and cultural needs.

### 7.3 Culture-Oriented Strategies

Designers should pay full attention to the applicability of new technologies. The corresponding questions of H4c Social Identity are Q22 and Q23. The results show that the return of users is affected by the change in social identity. This type of user return is a contradictory boundary management process. When users face a big change in social identities, such as entering a higher school, changing jobs, etc., they feel that they are kidnapped and controlled by it for some time, and streaming media is a destructive and oppressive thing [15, 34]. However, when users adapt to their new social identities, in the Objectification (P4) and Incorporation (P5) stages, they will re-plan and think about the hedonic content and re-incorporate streaming media into their lives. However, there are not many technologies on the market that can gain insight into the user's identity change. Meanwhile, the research on perception and behavioral computing also faces important problems, including the evolution, multifacetedness, fickleness, and fragmentation of user behavior, the fragmentation, heterogeneity, spatiotemporal correlation, representativeness, sparsity, computability, and comparability of behavioral data [38], and the research is even slowed down due to the controversial privacy issues. In recent years, if the AI technology, which has developed rapidly in the Greater Bay Area through industrial clusters and investment, is further developed, the social behavior of users can be accurately monitored by the platform and the best time to return can be calculated, and problem-solving will be accelerated. Therefore, designers should fully connect with scientific and technological personnel to help the platform seize the first opportunity in the Internet 4.0 era.

### 7.4 Society-Oriented Strategies

Designers should fully develop social design strategies. The corresponding questions of H2b Social Urgency are Q8 and Q9. Research shows that offline social networking will lead users to return to use. We also believe that designers should use "new retail" thinking to create opportunities to engage with churn users and let them know about product changes. On the one hand, the Greater Bay Area has mature technical and commercial resources. During the epidemic, when safety is ensured, streaming media platforms can cooperate with relevant departments to fully integrate VR, AR, and interactive media technologies to create installation art that can impress users, brand culture experience



**Fig. 5.** Future Strategies for UX designers.

campus, cross-border pop-up stores, product experience centers, etc. That allows users to fully release the pressure of life and perceive the new cultural value and practical characteristics of products in the process of participation. On the other hand, corporate social responsibility is directly linked to sustainable development [4]. The streaming media platforms in the Bay Area have sufficient funds, and they should break the traditional concept and choose not to take short-term profit as the only development indicator. Instead, they are supposed to focus on social charity, community welfare investment, etc. to gain favorable social comments to attract lost users to return. Therefore, in addition to business and technology, designers still need to consider the creation of new strategies from a social perspective (Fig. 5).

User recreation is a subjective, situational, complex, and dynamic experience. Designers pay attention to the user’s internal state (psychological and physiological), design system characteristics (usability and function), and external environment (society and meaning) [13] when focusing on pain points and cutting into opportunities. It is necessary to abandon the one-sidedness and blindness at work and reorganize the content of sustainable operations. We suggest that designers of emerging platforms should focus on Commerce and Culture-oriented Strategies which are efficient and productive, while those of mature platforms, should focus on Technology and Society-oriented Strategies for a long time, to help enterprises formulate personalized sustainable operation strategies.

## 8 Conclusion

First of all, in this paper, we put forward the short-term success and the potential crisis of the unsustainable operation of streaming media in the Greater Bay Area based on some practical and research hot spots. Meanwhile, we included the phenomenon in the horizontal and vertical comparison of theories and found the theoretical defects and extendibility of the research. Secondly, we designed research variables and hypotheses in the way of realistic interviews, published and collected the views of 731 users in the Greater Bay Area on user return in the form of questionnaires, extracted key variables using diversified analysis methods, and constructed a new theoretical framework for Re-domestication. Last, we provided suggestions for operational design that designers can make in terms of business, technology, culture, and society.



From a theoretical point of view, we make forward-looking explorations for Domestication, which has regional limitations and little research in China, encourage researchers to focus on hedonic media, and pay close attention to the cyclic Conversion (P6)-Appropriation (P3) adjustment process. From a practical point of view, we remind designers that the user does not use is also a part of the experience. With limited user resources, the cost of awakening lost users is much lower than finding new users, and they should contribute more strategies to the enterprise with user return. However, we believe that our research still has some deficiencies. The cognitive differences and variable design of users in Hong Kong, Macau, and the Pearl River Delta region need to be further dismantled and optimized. Additionally, more data should be collected and combined with the interview.

It is known that the market value of Netflix Inc. (NFLX), the king of streaming media, exceeded US\$300 billion in 2021, and in the third quarter, it achieved US\$7.483 billion in revenue with a year-on-year growth rate of 83.4% (Marketwatch., 2021, November 10). That indicates streaming media has gradually become a mainstream way of enjoyment for modern people. It is believed that in the near future, under the catalysis of the people-oriented metaverse, multi-modal interaction, and intelligent interconnection technology in the Internet 3.0 era, streaming media will usher in greater development. Streaming media designers and researchers should fully understand sustainable operations strategies and utilize user return to break the homogeneous competition in operations.

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