

How socio-demographic factors affect the personal finance management application assessment during the Covid period in Vietnam?

Nguyen Duong Thanh Thao¹, Ha Minh Tri^{2,3*}

¹Eastern International University, Binh Duong, Vietnam

²International University, Ho Chi Minh City, Vietnam

³Vietnam National University, Ho Chi Minh City, Vietnam

*Corresponding author: hmtri@hcmiu.edu.vn

ARTICLE INFO

ABSTRACT

DOI:10.46223/HCMCOUJS.
econ.en.14.1.2396.2024

Received: August 13th, 2022

Revised: December 05th, 2022

Accepted: January 11th, 2023

JEL classification code:

D14; G21; G41; G53

Keywords:

financial behavior; fintech;
pandemic Covid-19; personal
financial management

The research is carried out to identify how socio-demographic factors are related to the assessment of personal finance management applications. The authors collected observations via an online survey in Vietnam. The architecture of the article included: the transparency, intuitiveness, functionality, and faults of the application, whether it meets financial needs of customers, the level of satisfaction with the application as well as the introduction to other people, the benefits and also disadvantages of the application, and the use of personal financial management application during the Covid-19 period. The study demonstrated that users would use banking applications rather than financial managers offered by non-banking organizations. The findings indicate that the applications are diaphanous, well-organized, and intuitive and the examined people are pleased with using them. The coronavirus pandemic has opened room for finding challenges in remote financial services, such as the potential risk of information security, the complexity of installing and using the applications, and so on.

1. Introduction

Most of human life is spent on earning money and using money to achieve happiness. Therefore, financial satisfaction has become an important factor in determining the level of happiness. Recently, financial management behaviors have received increasing attention from all ages. Some people, even those who are considered economic individuals, usually face financial distress, which occurs when their earnings cannot meet their spending, mostly due to insufficient personal finance management, although they have a stable income. In order to achieve a desired financial level, advice from professionals plays a crucial role in any decision-making. Realizing that more and more banking sectors, and financial institutions, have built up many services to fulfill the needs of customers.

Today, when globalization and technology are intimately intertwined, thanks to the development of technology and the appearance of Fintech, it has become possible for them to 'personalize customer services and switch to remote channels' (Waliszewski & Warchlewska, 2021a, p. 682). Mobile applications and website applications are typical examples of applying technology in Fintech. It is believed that with Fintech, financial services providers can combine many functions, such as types of banks, asset and wealth managers, fund and payment, brokers, exchanges, and insurers (Schueffel, 2016).

Furthermore, the SARS-CoV-2 pandemic also made a shift in the expectations and needs of customers around the world. The pandemic has also made people give prominence to the importance of savings and investments in life. Therefore, it is essential for banking organizations and other financial institutions to understand more deeply the attitudes and experiences of customers when using the applications in order to improve, enhance, and develop more convenient functions, which helps the companies become strong competitors in the market share. There are some popular personal finance management applications for Vietnamese people, which are Banking applications, Momo e-wallet, Finhay, Money Keeper, and so on.

Various global studies examine the influence of socio-factors and demographic characteristics on the assessment of financial management applications. Some analyses uncovered on this topic are: Waliszewski and Warchlewska (2020) conducted a survey about Poland inhabitants; Waliszewski and Warchlewska (2021b) explored the young generation in Poland; Waliszewski and Warchlewska (2021a) investigated this topic in the situation in Covid-19 pandemic. However, despite the importance of such a topic, just a few academic papers have examined this area in the Vietnamese context, particularly those exploring the current circumstance when humans have nearly overcome the coronavirus pandemic and stepped into the 'New Normal' status. Therefore, this research aims to delve into the relationship between sociodemographic features in explaining the assessment of personal financial management applications among people who live in Vietnam.

The study covers 5 sections. Section 2 shows a review of related academic papers. Section 3 is about the methodology. Section 4 illustrates not only the results but also the discussions. The final part gives conclusions and further recommendations.

2. Theoretical basis

In order to be competitive and strive in the digital world, businesses have to always keep up with the digital transformation. According to Bloomberg (2018), 'digital transformation is about the customer' (p. 6). The enterprise is required to become 'customer-driven end-to-end' as well as implement digital technologies.

One of the approaches to exploring digital transformation is consumer behavior. There are many factors that influence consumer behavior, which include the effects on the environment. A study carried out by Sheth (2020) points out that because consumer habits and behavior are contextual, natural disasters and pandemics can disrupt or change consumer habits and behavior (p. 280). A typical example is the Covid-19 pandemic. As the coronavirus spread out at an unpredictable speed, most countries had to restrict all people's movement, to mitigate the spread of the disease. Therefore, consumers had to generate new habits and behaviors to adapt to the current situation. The rise of digital usage, such as online learning, online payments, and online shopping, has become the 'New Normal' for nations all over the world. It can be said that the Covid-19 outbreak has become the stimulus causing the behavioral change of individuals and accelerating the role of digital transformation for both customers and businesses in the post-pandemic.

When the number of users has increased, the businesses have to enhance the quality to maintain customer retention and expand market share in the future. In order to do that, the company has to understand how the customers make decisions.

A variety of banks and financial institutions have developed personal finance management applications in order to support people in managing their finances. The personal finance management application is established as a mobile or website application with the aim of helping people understand their cash flow, income, and spending so that they can have maximum control

over their money. Moreover, the applications also have other effective functions, such as making a budget, warning overpayments, and so on.

Hypotheses development

According to Kozhevnikov, Slupko, and Sergeev (2019), ‘simplicity, accessibility, elegance, practical benefits, flexibility, and mobility’ are the characteristics that can popularize personal finance management applications (p. 110). Therefore, this research formulated the following hypotheses:

H1: Gender would be statistically significantly related to the user-friendliness and transparency features of personal finance management applications

H2: Age would be statistically significantly related to the level of complexity, the structured feature, user-friendliness, intuitiveness, and the notice of flaws

H3: Education would be statistically significantly related to the intuitiveness and assessment of application errors

H4: Place of residence would be statistically significantly related to all assessments of personal finance management applications

H5: Level of income would be statistically significantly related to the evaluation of how complicated to install the applications, how well-organized the applications are, and how satisfied the users are

H6: Career would be statistically significantly related to all assessments of application except the recognition of errors

H7: Marital status would be statistically significantly related to the level of complication of installation, transparency, structured feature, and the notice of flaws in applications and the recommendation to other people

3. Methodology

The statistical method applied in this study to analyze the obtained results is Pearson’s Chi-squared test and Cramer’s V correlation.

Franke, Ho, and Christie (2012) proposed that Karl Pearson’s Chi-squared test is ‘one of the most utilized statistical analyses’ for exploring whether the categorical variables are associated with or different from each other (p. 448). By analyzing contingency tables, the outcome of the Chi-squared test can demonstrate if experimental factors are related to one another. When they are relevant, Pearson’s Chi-squared test can even answer the question about what kind of their relationship is, positive or negative. From those results, it can be easy to compare with theoretical hypotheses from previous related academic research in order to understand completely the characteristics of the collected observations.

Just figuring out the connection of variables is not enough. Another common question usually asked parallelly is how strong the relationship is. To give an accurate response, the Phi coefficient is normally used combined with the Chi-squared test. It is a measurement of the strength of the examined association between two categorical variables. However, this assessment is only used for a 2x2 contingency table. Therefore, in this study, Cramer’s V correlation is applied as Akoglu (2018) stated that ‘Cramer’s V is an alternative to Phi in tables bigger than 2x2 tabulation’ (p. 92). Similar to Pearson’s r , there is no connection between variables when the value is close to 0, but if the value is bigger than 0.25, it is considered a very strong relationship.

Besides the method applied in the study for analysis, the way of collecting data is also important. Despite several disadvantages, a questionnaire created using Google Forms still brings benefits for both interviewer and interviewee. An online survey can be answered at any time, from anywhere, which is so convenient for interviewees. Moreover, the interviewees can also spend more time thinking carefully before answering each question, which ‘enables the research process to become more reflective’ (Ha, 2022, p. 4). The online method can also maintain safety concerns, especially during the Covid-19 pandemic.

The study of personal finance management applications in Vietnam during the Covid-19 period was nationwide and carried out on a group of N = 521 people via the online questionnaire made through Google Forms. There are 426 respondents who admitted that they use the applications to assist them in managing their finances, meanwhile, other 95 people did not use any such applications. Among those who did not use applications, the majority were students who might not really consider managing personal finances. Furthermore, one of the main reasons that personal financial management applications were not popularly used in human daily life is the difficulty in accessing and using the applications.

4. Result and discussion

4.1. Result

The studied group mainly consisted of women (58.9% of the users), and people aged from 26 years old to 35 years old (38%). Respondents who graduated from college and university accounted for over 82% of the group. In addition, in terms of career, employees who work for private companies accounted for 45% of the respondent group. People living in Ho Chi Minh City were the major component, with a percentage of over half.

Table 1

Features of the studied group in terms of sex, age, education, career, place of residence, monthly income, and marital status

		Application users		Do not use an application	
		N	%	N	%
Sex	Male	175	41.1%	34	35.8%
	Female	251	58.9%	61	64.2%
Age	18 - 25	129	30.3%	51	53.7%
	26 - 35	162	38.0%	18	18.9%
	36 - 45	95	22.3%	6	6.3%
	46 - 55	36	8.5%	4	4.2%
	Above 55	4	0.9%	16	16.8%
Education	Under high school	3	0.7%	5	5.3%
	High school	28	6.6%	30	31.6%
	College & Bachelor	350	82.2%	53	55.8%
	Post - graduation	45	10.6%	7	7.4%
Career	Student	83	19.5%	40	42.1%
	Employee in a public company	58	13.6%	8	8.4%
	Employee in a private company	192	45.1%	18	18.9%
	Self - employed	36	8.5%	14	14.7%

		Application users		Do not use an application	
		N	%	N	%
	Unemployment	2	0.5%	1	1.1%
	Homemaker	45	10.6%	6	6.3%
	Retired	10	2.3%	8	8.4%
Place of residence	Hanoi	86	20.2%	14	14.7%
	Ho Chi Minh City	215	50.5%	16	16.8%
	Danang	22	5.2%	3	3.2%
	Binh Duong	69	16.2%	44	46.3%
	Ha Tinh	7	1.6%	9	9.5%
	Hue	12	2.8%	0	0.0%
	Nghe An	9	2.1%	3	3.2%
	Others	6	1.4%	6	6.3%
Monthly Income	Below 05 million VND	89	20.9%	42	44.2%
	05 - 10 million VND	105	24.6%	22	23.2%
	10 - 15 million VND	144	33.8%	8	8.4%
	15 - 20 million VND	49	11.5%	11	11.6%
	Above 20 million VND	39	9.2%	12	12.6%
Marital status	Single, never married	233	54.70%	36	37.90%
	Married	191	44.80%	58	61.10%
	Divorced	2	0.50%	0	0.00%

Note: N - number, % - percentage

Source: Author's synthesis

In the examined group, most of the people used bank applications, which were admitted by 408 users, accounting for 96% of respondents. Besides, Momo e-wallet, a non-banking application, also became the second most popular software when it was said to be used by 301 individuals, which was over 70% of examinees. Other frequently mentioned were Money Lover, Finhay, Excels, and MISA Money Keeper.

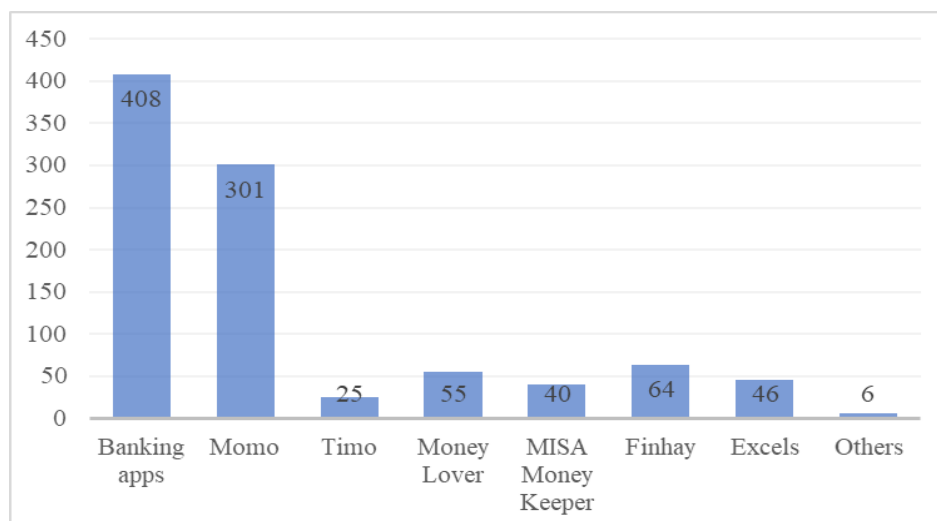


Figure 1. Personal financial management applications used

Source: Author's synthesis

The research also indicates that all 426 users prefer using mobile applications to the website version. However, among those, there were 25 people, accounting for 6% of users, who used the website applications paralleling the mobile form.

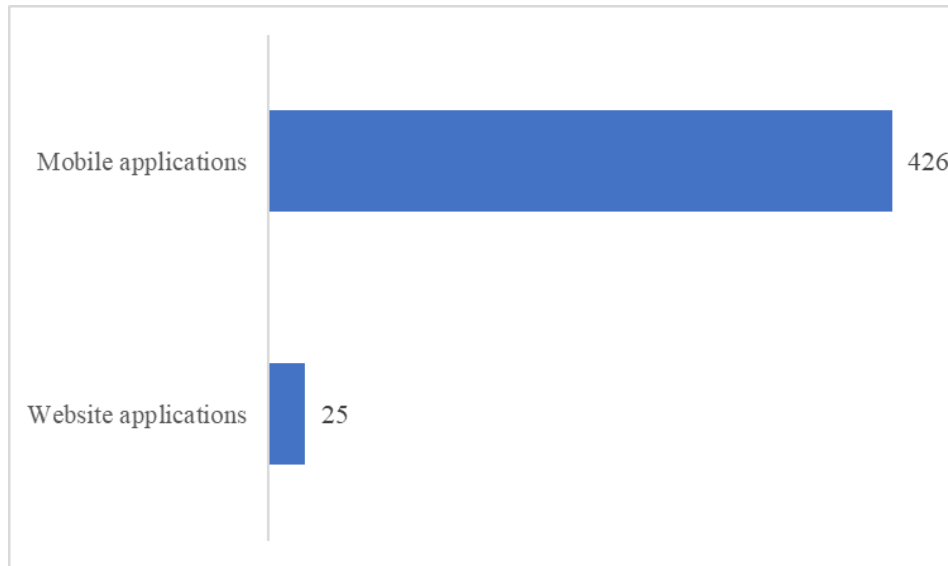


Figure 2. Type of personal finance management applications used

Source: Author's synthesis

Most people in the survey confessed that they have used the applications to assist them in managing their finances for quite a long time. One-third of respondents have used them for 1 - 3 years, while only 5% of them just started to use the applications under 6 months.

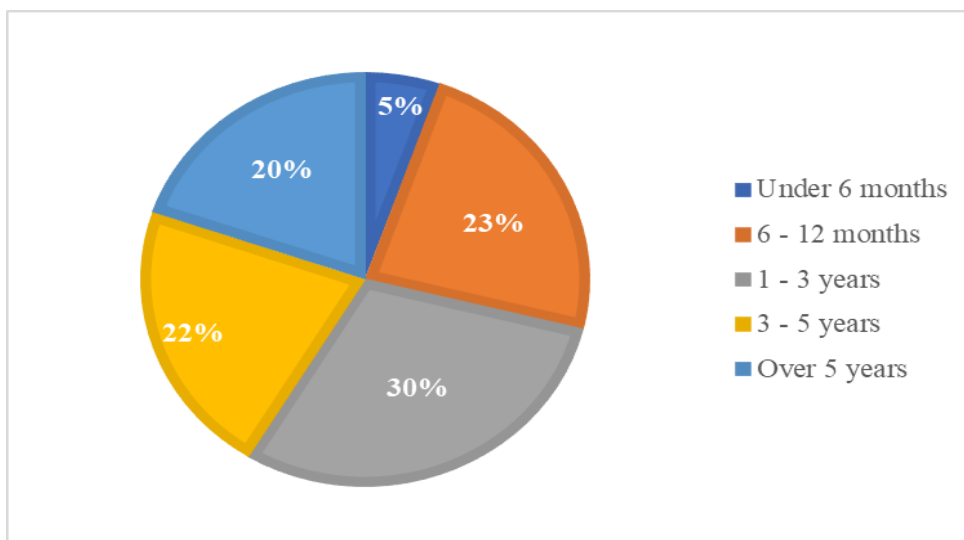


Figure 3. Time of using personal financial management applications

Source: Author's synthesis

On the one hand, a total of 96% of users believed that personal finance management applications helped them to monitor their income and payments each period of time. Moreover, controlling expenses was also another benefit that was highly regarded by 74% of respondents. Other advantages that were also frequently mentioned were that the personal finance management applications summarized and evaluated the users' financial performance (42%) as well as connected to the bank accounts (47%) and integrated with other bank products or services (47%).

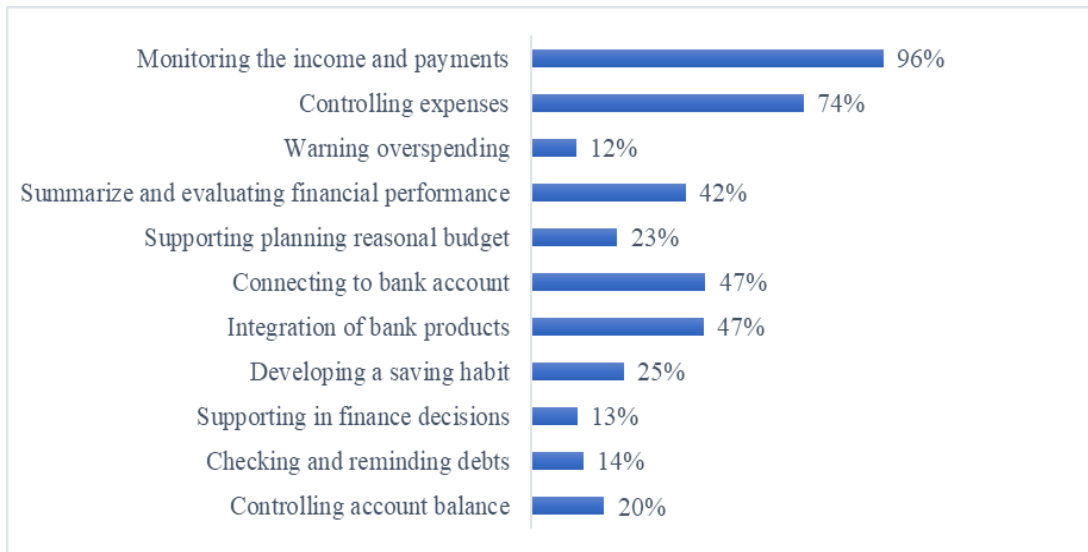


Figure 4. List of benefits to be gained from using personal financial management applications

Source: Author's synthesis

On the other hand, the investigated individuals also acknowledged several challenges when using personal finance management applications. There were 188 people, which was nearly half of the respondents who were afraid of leaking their personal information. Also, following the risk of information security was the fact that some displays and items of the applications were difficult for people to access and use. A total of 44% of people agreed. Moreover, the users could not get any advice from the professional consultants provided by the applications (40%). Other minor disadvantages were manually recording all financial behaviors (32%) and the fee to use some special functions (16%). Those inconveniences partly decreased the interest of people in using personal financial management applications.

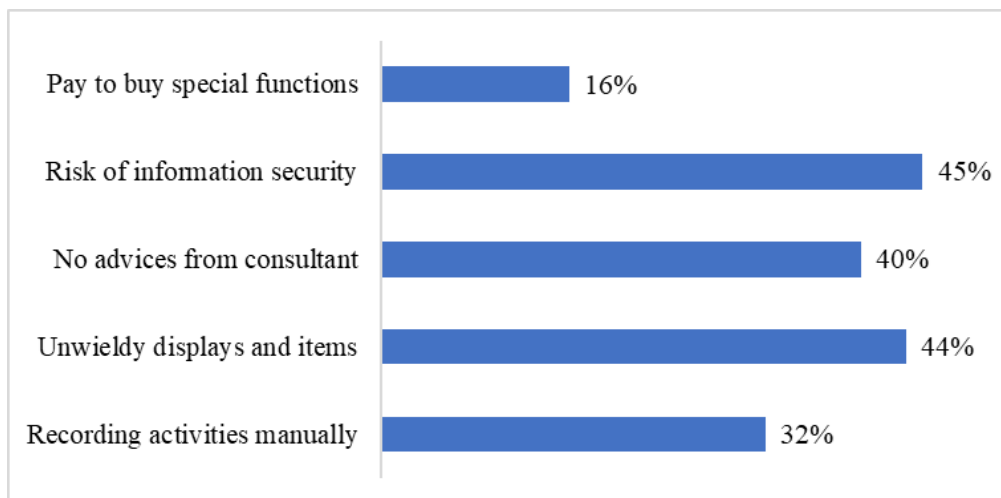


Figure 5. List of challenges of using personal finance management applications

Source: Author's synthesis

However, the importance of personal finance management applications in daily human life was considerably realized when coronavirus appeared, and the Covid-19 pandemic had a significant influence on the change of habits and demands of humans, especially Vietnamese

inhabitants. The coronavirus outbreak caused a heavy drop in the income of people when most businesses had to close or stop operating. There were over 80% of respondents suffered an income reduction during the pandemic. Some individuals (nearly 10%) had to leave jobs and became unemployed. Due to earnings decrease, combined with the high expenses, half of people had to cut their daily payments in order to maintain a basic life. In addition, some also faced many difficulties in borrowing money services.

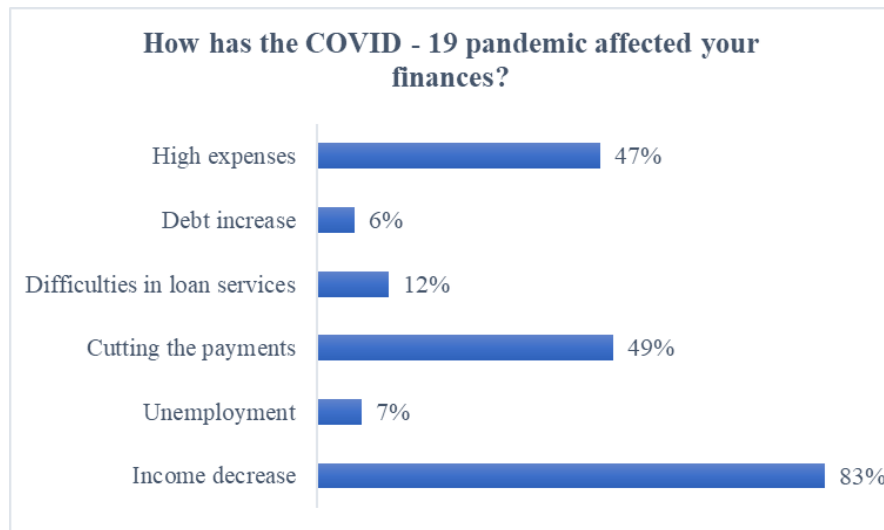


Figure 6. Effects of the Covid-19 pandemic on finances

Source: Author's synthesis

Of 426 users, there was a quarter believed that the personal finance management applications supported them in managing their finances when they were self-isolation, quarantined, or even working from home. Just around 15% of users totally disagreed with the assistance of the applications in finance management behaviors.

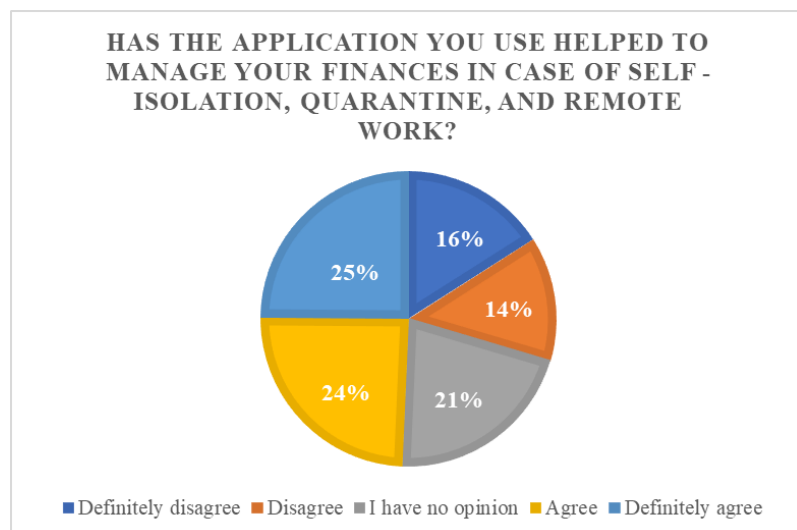


Figure 7. Using applications in the context of self-isolation, quarantine, and remote work

Source: Author's synthesis

Furthermore, the purpose of conducting this research was to identify, inter alia, how extent socio-demographic factors are associated with the evaluation of personal financial management applications. Therefore, a series of Pearson's Chi-squared tests combined with Cramer's V

correlation is carried out in order to investigate the relationship between socio-demographic factors and the personal finance management applications assessment of users who live in Vietnam during the Covid-19 period of time.

Table 2

Consequences of Chi-squared test of the association between the evaluation of personal financial management applications and gender

Gender	χ^2	df	p	V
How arduous was the installation?	4.693	4	0.320	0.105
How diaphanous was the using application?	9.685	4	0.046	0.151
How organized was the using application?	5.911	4	0.206	0.118
How user-friendly was the using application?	11.840	4	0.019	0.167
How intuitive was the using application?	2.491	4	0.646	0.076
Are there any errors in the using application?	7.391	4	0.117	0.132
How satisfied do you feel when using the application?	3.842	4	0.428	0.095
Do you want to suggest the application to people around you?	8.174	4	0.085	0.138
Was the application helpful in managing your finances when you were in self-isolation, quarantine, and remote work?	6.486	4	0.166	0.123

Note: χ^2 - Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship

Source: Author's synthesis

The result table of Chi-squared analyses above pointed out that in the socio-demographic factors party, gender was just statistically significantly associated with the transparency valuation of the personal finance management applications $\chi^2 (4) = 9.685$; $p < 0.05$; $V = 0.151$ and how users assess the friendliness of the applications $\chi^2 (4) = 11.840$; $p < 0.05$; $V = 0.167$.

In the party of examined users, women (12%) seemed to more appreciate the transparent feature of the personal financial management applications that they used than men (5%). The average score also indicates that male users were less satisfied with the transparency of the applications than female users, with $M = 2.72$ points for men and $M = 3.1$ points for women, on a 1 - 5 scale.

On the other hand, the user - friendliness of the applications is highly valued. There are 25% of men and 20% of women fully agreed that their personal financial management applications were accessible to the users. The average score is also higher compared with the score of the transparency feature. Male respondents rated $M = 3.2$ points and female respondents rated $M = 3.3$ points.

Although there are differences in assessments between transparent and user-friendly characteristics, these relationships with gender factors are strong, with $V = 0.151$ and $V = 0.167$, respectively.

The next Chi-squared test studies the association between the evaluation of personal financial management applications and age.

Table 3

Consequences of Chi-squared test of the association between evaluation of personal financial management applications and age

Age	χ^2	df	p	V
How arduous was installation?	33.879	16	0.006	0.141
How diaphanous was the using application?	15.643	16	0.478	0.095
How organized was the using application?	26.725	16	0.045	0.125
How user-friendly was the using application?	26.622	16	0.046	0.125
How intuitive was the using application?	30.661	16	0.015	0.134
Is there any errors of the using application?	53.303	16	0.000	0.176
How satisfied you feel when using the application?	23.316	16	0.106	0.117
Do you want to suggest the application to people around you?	13.467	16	0.638	0.548
Was the application helpful in managing your finance when you were self-isolation, quarantine, and remote work?	19.498	16	0.244	0.107

Note: χ^2 - Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship

Source: Author's synthesis

From the above table, it can be seen that age was statistically significantly linked with the judgement of many aspects, including the level of complication to install the application χ^2 (16) = 33.879; $p < 0.05$; $V = 0.141$; the well - organized feature χ^2 (16) = 26.725; $p < 0.05$; $V = 0.125$; the user – friendliness χ^2 (16) = 26.622; $p < 0.05$; $V = 0.125$; the intuitiveness χ^2 (4) = 30.661; $p < 0.05$; $V = 0.134$, and the notice of application flaws χ^2 (4) = 53.303; $p < 0.05$; $V = 0.176$.

There are 118 users, which accounts for 28% of ages found that it was very easy to install the applications. The average rated score for the level of ease of installing the application is also high, $M = 3.5$ points. However, the younger users are the easier it is to set up. Compared to other age groups, there are 35% of the young generation, which is also the highest percentage of the class who gave 5 points when valuing the level of ease of financial management applications installation. The group of people aged from 18 to 35 rated $M = 3.7$ points on average for this feature, which is higher than the score the older valued, $M = 3.4$ points.

Furthermore, although the young group, which aging from 18 to 35, in general, found more weaknesses in personal financial management applications than the others, the middle group aging from 36 to 45 years old recognized the most flaws in the applications. There are 33% of this group totally agreed that their used applications had bugs, and the average score of agreement they rated is the highest, $M = 4$ points.

For evaluating the user - friendliness of the applications, individuals who were in the 46 to 55 years old group did not agree that the applications they used were friendly to users, especially for the freshers. Meanwhile, the oldest class of people who were 55 years old and above gave $M = 4.5$ points on average for friendliness, which is also the highest score for this aspect.

On the other hand, most people in the survey rated the intuitiveness quite high, which is indicated by the average scores of classes, M , spreading from 3.5 to 4 points.

In general, the bond between ages and the evaluation of the level of complication, how applications are well-organized, the users-friendliness, the intuitiveness, and the notice of errors in personal financial management applications are strong, with the correlations V equal 0.141, 0.125, 0.125, 0.134 and 0.176, accordingly.

Table 4

Consequences of Chi-squared test of the association between evaluation of personal financial management applications and education

Education	χ^2	df	p	V
How arduous was the installation?	8.085	12	0.778	0.079
How diaphanous was the using application?	14.105	12	0.294	0.105
How organized was the using application?	8.430	12	0.751	0.081
How user-friendly was the using application?	8.663	12	0.731	0.082
How intuitive was the using applicaetion?	21.463	12	0.044	0.129
Ar there any errors in the using application?	33.953	12	0.001	0.162
How satisfied do you feel when using the application?	16.676	12	0.162	0.114
Do you want to suggest the application to people around you?	9.658	12	0.646	0.087
Was the application helpful in managing your finances when you were in self-isolation, quarantine, and remote work?	14.353	12	0.279	0.106

Note: χ^2 - Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship

Source: Author's synthesis

The third result table of the Chi-squared analysis series indicated that the level of education was just only statistically significantly related to the intuitiveness $\chi^2 (12) = 21.463$; $p < 0.05$; $V = 0.129$ and the realization of flaws $\chi^2 (12) = 33.953$; $p < 0.05$; $V = 0.162$.

Similar to the age groups, around 30% of users in each education class totally agreed that their personal financial management applications were intuitive and the functions were easy to use. The average rated score of under high school, high school, bachelor and college, and post - graduated users are $M = 3.9$ points, $M = 3.7$ points, $M = 3.5$ points, and $M = 3.6$ points, respectively. The higher the score the more satisfied the users are.

However, in noticing the bugs in the applications, those who just did not finish high school seemed not to find more inconvenience than the remaining groups. While the average score of M rated by high school users, college and undergraduate people, and higher education individuals higher than 3.5 points ($M = 3.5$), the score under high school class just equaled 2.7 points ($M = 2.7$), which is a low mark.

The Cramer's V correlation between the level of education and the judgment of intuitiveness of the personal financial management applications is in the range of 0.10 to 0.15, $V = 0.129$. This indicates that the relationship between education and judgment of intuitiveness is just moderate. Meanwhile, the association between education and notice of the flaws in applications is strong due to the correlation $V = 0.162$.

Table 5

Consequences of the Chi-squared test of the association between the evaluation of personal financial management applications and place of residence

Place of residence	χ^2	df	p	V
How arduous was installation?	51.004	28	0.005	0.172
How diaphanous was the using application?	129.368	28	0.000	0.265
How organized was the using application?	127.469	28	0.000	0.273
How user-friendly was the using application?	55.021	28	0.002	0.179
How intuitive was the using application?	65.841	28	0.000	0.196
Is there any errors of the using application?	100.706	28	0.000	0.242
How satisfied you feel when using the application?	125.496	28	0.000	0.270
Do you want to suggest the application to people around you?	141.006	28	0.000	0.287
Was the application helpful in managing your finance when you were self-isolation, quarantine, and remote work?	63.842	28	0.000	0.193

Note: χ^2 - Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship

Source: Author's synthesis

As can be seen from the above table, the relationship between place of residence and the assessment of personal financial management applications in Vietnam was statistically significantly connected in all elements.

Although the Cramer's V correlations between the place of residence and all examined facets are larger than 0.15, which shows strong connections, the correlation V between location and transparency, organized display of the applications, satisfaction, and how likely users want to recommend the applications to other people are larger than 0.25, with $V = 0.265$, $V = 0.273$, $V = 0.270$ and $V = 0.287$, accordingly. These numbers demonstrate that those relationships are considered very strong.

People who lived in Binh Duong and Ha Tinh seemed to realize how transparent the applications are when there are 33% of respondents in Binh Duong and 57% of users in Ha Tinh marked 5 points for this characteristic. Most respondents in these provinces appreciated the personal financial management applications' transparency, so the average rated scores of these groups were around 4 points ($M = 4$), which was much higher than the scores of the other classes, even compared to the groups living in large cities like Hanoi, Ho Chi Minh City, and Danang City. However, the transparent feature of the personal financial management applications was not really valuable to Hue inhabitants when there are 50% of Hue respondents gave 1 point for this feature, which also makes the rated average score of this class become the lowest, $M = 1.92$. The transparency is evaluated highly due to the well-organized structure of the application. Therefore, the assessment of how the applications are organized is quite similar to the rate for transparency.

Because the satisfaction of users mostly has an influence on how likely to recommend the applications to other people, the result of examining the connection between locations and how

likely the users want to introduce the applications to their family members and friends are quite identical to the outcome of assessing the relation of the place of residence and satisfaction of users. The respondents living in Hanoi, Ho Chi Minh City, Danang City, and Hue Province were not likely to propose the personal financial management applications they use to other people, while the remains were on the opposite side. Despite that, the average rated scores for evaluating both characteristics were quite high for all studied groups, equaling to or larger than 3 points ($M \geq 3$).

Table 6

Consequences of Chi-squared test of the association between evaluation of personal financial management applications and monthly income

Income	χ^2	df	p	V
How arduous was installation?	29.737	16	0.019	0.132
How diaphanous was the using application?	19.683	16	0.235	0.107
How organized was the using application?	32.375	16	0.009	0.137
How user-friendly was the using application?	22.934	16	0.116	0.116
How intuitive was the using application?	21.392	16	0.164	0.112
Is there any errors of the using application?	22.956	16	0.115	0.116
How satisfied you feel when using the application?	27.592	16	0.035	0.127
Do you want to suggest the application to people around you?	21.507	16	0.160	0.112
Was the application helpful in managing your finance when you were self-isolation, quarantine, and remote work?	16.628	16	0.410	0.098

Note: χ^2 - Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship

Source: Author's synthesis

The table shows the relationship between the level of income and how personal finance management applications are evaluated. The income of respondents has a statistically significant impact on the assessment of the level of complications to installation $\chi^2 (16) = 29.737$; $p < 0.05$; $V = 0.132$, application's organization $\chi^2 (16) = 32.375$; $p < 0.05$; $V = 0.137$, and satisfaction of users with the applications $\chi^2 (12) = 27.592$; $p < 0.05$; $V = 0.127$. With the Cramer's V correlations larger than 0.1 but smaller than 0.15, these relationships are just at a moderate level.

Overall, most people in income classifications believed that it was quite easy for them to install personal financial management applications when there are at least nearly 20% of each group fully admitted the ease of installation. Among those classifications, individuals who earned more than 20 million VND accounted for the most, which was 41%, and those who earned less than 5 million VND accounted for 37%, which ranked second. Although the rated score on average for the level of ease of these two groups also took the highest and second positions as well, the order was in reverse. However, the difference between these two scores is not considerable, around $M = 3.8$ points. Furthermore, the other groups also marked this element quite high. The lowest score was $M = 3.04$ points, which belongs to the class of those who earned from 15 to 20 million VND. The result of judging the organizational display had several similarities as assessing the level of ease of the applications.

Even though individuals who earned 10 - 15 million VND each month seemed to be the least satisfied group with the experience of using the personal financial management applications, their satisfaction still scored $M = 3.1$ points, which was high compared to the lowest scores of other assessments.

Table 7

Consequences of Chi-squared test of the association between evaluation of personal financial management applications and career

Career	χ^2	df	p	V
How arduous was installation?	39.054	24	0.027	0.151
How diaphanous was the using application?	52.070	24	0.001	0.174
How organized was the using application?	75.083	24	0.000	0.209
How user-friendly was the using application?	55.654	24	0.000	0.180
How intuitive was the using application?	45.141	24	0.006	0.162
Is there any errors of the using application?	25.168	24	0.397	0.121
How satisfied you feel when using the application?	130.903	24	0.000	0.276
Do you want to suggest the application to people around you?	54.932	24	0.000	0.179
Was the application helpful in managing your finance when you were self-isolation, quarantine, and remote work?	54.258	24	0.000	0.178

Note: χ^2 - Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship

Source: Author's synthesis

The Chi-squared analysis table yielded a number of statistically significant results for the association between how personal financial management applications are rated and occupation. The only indication was that career was not connected with the notice of bugs in the software the respondents used $\chi^2 (24) = 25.168$; $p = 0.397$; $V = 0.121$.

By considering the Cramer's V correlation, it can be seen that, among those strong bonds between career and the remaining elements of assessment ($V > 0.15$), the career of respondents was strongly related to the satisfaction with the applications they used, $V = 0.276$, which was larger than 0.25.

Most people who have already retired found that it was not really easy for them to install the software. Thus, nearly 40% of the retirement group gave 1 point when marking the level of ease to set up the applications. This realization caused the average rated score to be the lowest among all groups, $M = 2.5$ points. In addition, the organizational display of the applications did not leave a good impression on such people when the same result was obtained.

Table 8

Consequences of Chi-squared test of the association between evaluation of personal financial management applications and marital status

Marital Status	χ^2	df	p	V
How arduous was installation?	11.361	8	0.027	0.142
How diaphanous was the using application?	29.370	8	0.000	0.185
How organized was the using application?	29.427	8	0.000	0.185
How user-friendly was the using application?	8.387	8	0.397	0.099
How intuitive was the using application?	12.561	8	0.128	0.121
Is there any errors of the using application?	15.777	8	0.046	0.136
How satisfied you feel when using the application?	9.026	8	0.340	0.103
Do you want to suggest the application to people around you?	17.998	8	0.021	0.145
Was the application helpful in managing your finance when you were self-isolation, quarantine, and remote work?	11.681	8	0.166	0.117

Note: χ^2 - Chi-squared statistics, df- number of degrees of freedom, p- level of statistical significance, V- strength of the Cramer's V relationship

Source: Author's synthesis

The last Chi-squared analysis gave a number of statistically significant results for the relationship between marital status and how personal finance management applications were evaluated. However, the table also provided that the marital status of a person was not related to how the applications were friendly to users $\chi^2 (8) = 8.387$; $p = 0.397$; $V = 0.099$, how its functions were easy to use $\chi^2 (8) = 12.561$; $p = 0.128$; $V = 0.121$, the satisfaction with the applications $\chi^2 (8) = 9.062$; $p = 0.34$; $V = 0.103$ and how the impact of the applications on finance management in the self - isolation period was assessed $\chi^2 (8) = 11.681$; $p = 0.166$; $V = 0.117$.

Although the remaining factors in the assessment were statistically significantly linked with the marital status of a person, the strength of relationships between marital status and the level of complexity of installing the software, the notice of flaws, and how likely users wanted to introduce the applications to other people were just moderate because the Cramer's V correlations were just in a range of 0.1 to 0.15. However, the bond of marital status and the judgment of transparency, as well as the organized display of the personal financial management applications, was strong, presented by the value of correlations $V = 0.185$, which is more than 0.15 but smaller than 0.25, for both connections.

Generally, divorced people seemed to highly evaluate most of the aspects of the personal financial management applications when they gave a very high score for each judgment, the lowest score was 4 points ($M = 4$) for the notice of errors in applications. Such people tended to believe that the applications they used were so well-organized and transparent that they would introduce the applications to their family members as well as friends.

On the other hand, the individuals who were not yet getting married admitted that they did not rely on the transparency of the personal financial management applications. Nearly one-fourth of the people in this group just rated 1 point for this feature. Hence, the average score that single

individuals gave was the lowest, $M = 2.76$ points. Therefore, it was understandable when just 9% of single people and 12% of married ones decided to recommend personal financial management applications to others.

4.2. Discussion

The research is carried out in order to verify how popular and advantageous the personal finance management applications supporting people who live in Vietnam during the Covid-19 pandemic. The low publicity of applications assisting the behavior of financial management in various market studies, especially those related to Vietnamese characteristics, was a reason to conduct this survey.

The study illustrated that most people living in Vietnam would rather use banking applications than those offered by non-banking institutions. This result is totally different from the result achieved by Waliszewski and Warchlewska (2021a), in which, respondents living in Poland preferred using applications provided by non-banking organizations to banking sectors. The contrast may be because in Vietnam, banking companies are more trustful than non-banking firms. In reality, the market for personal finance management applications is so diversified that customers have a variety of choices to use in order to meet their needs and preferences. Hence, the non-banking organizations have to wonder the reason why their products and services cannot compete with the applications offered by banks. Furthermore, both banks and other financial institutions also need to identify the causes that were behind the objection to the use of personal finance management applications by the remaining potential customers. From that, they are able to expand their market share, not only in Vietnam but also in the international market.

However, this research showed that due to the coronavirus pandemic, the interest in using personal finance management applications has escalated considerably. This may boost the acceleration of technological measures and some legal regulations related to remote financial services. Therefore, it should be prominent to continue conducting research on the topic of how beneficial personal finance management applications are to human daily life after Covid-19 when everyone gets back to normal life, especially when using applications is not a must for a transaction. Furthermore, it is also important to find out the link between the assessment of home finance management applications evaluated and socio-demographic factors. Hence, the banks as well as non-banking organizations, can have a general look at the pros and cons of their products and services so as to they can improve tools and attract more customers. It is also worthy for researchers who do consortium academic work on this topic.

5. Conclusions & recommendations

The study pointed out that there were more women likely to use personal finance management applications than men. Female users regarded the transparency of the applications as higher than male users, while both of them rated the user-friendliness nearly the same. Most examinees in all age parties gave a high score for evaluating the intuitiveness of the applications. Although respondents generally did not face many serious difficulties in installing the applications, it was easier for the young generation aged from 18 to 25 years old to do that than the older people. The middle age groups, which started from 26 years old to 55 years old, realized that the finance management applications they used were not really well-organized. Thus they found the bugs in the system more often than the youngest as well as the oldest classes. Among those, the group of individuals aged from 36 to 45 years old noticed the most. Meanwhile, the examinees in the 46 to

55 years old classification seemed to not really recognize the friendliness to users of the software they used. In addition, most of the people using the applications have higher education. These groups gave a high score for assessing the financial management applications but they were also the parties that found the flaws most.

The research also indicated that the place of residence was related to every assessed element of personal financial management applications. Inhabitants in Binh Duong and Ha Tinh rated all the features of the applications quite high, which demonstrated their happiness when using them. However, those who lived in key economic cities like Hanoi and Ho Chi Minh City, or even in some other large cities including Danang and Hue, seemed not to be fully pleased with the applications. Hence, they also would not likely introduce the applications to other people. The group of individuals who earned over 20 million VND was mostly satisfied with the personal financial management applications because they considered the applications clear and easy to use. This happened the same to those earning under 05 million VND. Besides, the retirement party admitted that they had to face difficulties in setting up the software and using it due to the not good display of items and functions. Last but not least, respondents who were divorced highly recommended the applications more than the rest, single and married parties because they found the program transparent, well-organized, and easy to install to use.

After obtaining the results from conducting a series of Chi-squared analyses, the authors realized that the results of this study were different from the research of Waliszewski and Warchlewska (2021a). The main reason for the dissimilarities may be due to the different characteristics of culture in Vietnam and Poland. Hofstede's cultural dimensions' theory showed that a society's culture would have an influence on its members' behavior (Hofstede, 2001). Therefore, it is essential for researchers to explore how culture affects financial behaviors generally, and the evaluation of personal finance management applications as well.

The Covid-19 pandemic has boosted remote customer service, especially in the finance sector. It has partly helped the financial business to realize some good and bad points in their applications. The study was carried out in the context of Covid-19 generally, and self-isolation, in detail, in order to determine opportunities and challenges for providers. Understanding how personal finance management applications' usability was evaluated gives room for them to improve, enhance and adapt to the shifts in demands of customers. The research confirmed the proposed hypotheses H1 - H7.

References

- Akoglu, H. (2018). User's guide to correlation coefficients. *Turkish Journal of Emergency Medicine*, 18(3), 91-93.
- Bloomberg, J. (2018). Digitization, digitalization, and digital transformation: Confuse them at your peril. *Forbes*, 28, 1-6.
- Franke, T. M., Ho, T., & Christie, C. A. (2012). The chi-square test: Often used and more often misinterpreted. *American Journal of Evaluation*, 33(3), 448-458.
- Ha, T. M. (2022). Data collection using online questionnaires in marketing. *SAGE Publications*, 1-12.

- Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations*. Newbury Park, CA: SAGE Publications.
- Kozhevnikov, V. A., Slupko, N. M., & Sergeev, A. V. (2019). Design and development of personal finance management system. *ISJ Theoretical & Applied Science*, 74(6), 110-115.
- Sampoerno, A. E., & Asandimitra, N. (2021). Pengaruh financial literacy, income, hedonism lifestyle, self-control, dan risk tolerance terhadap financial management behavior pada generasi milenial. *Jurnal Ilmu Manajemen (JIM)*, 9(3), 1002-1014.
- Schueffel, P. (2016). Taming the beast: A scientific definition of fintech. *Journal of Innovation Management*, 4(4), 32-54.
- Sheth, J. (2020). Impact of Covid-19 on consumer behavior: Will the old habits return or die? *Journal of Business Research*, 117, 280-283.
- Waliszewski, K., & Warchlewska, A. (2020). Socio-demographic factors determining expectation experienced while using modern technologies in personal financial management (PFM and robo-advice): A Polish case. *European Research Studies Journal*, 23(Special Issue 2), 893-904.
- Waliszewski, K., & Warchlewska, A. (2021a). How we can benefit from personal finance management applications during the Covid-19 pandemic? The polish case. *Entrepreneurship and Sustainability Issues*, 8(3), 681-699.
- Waliszewski, K., & Warchlewska, A. (2021b). The influence of sociodemographic factors on the attitudes and expectations of the younger generation towards modern finance. *Bank i Kredyt*, 52(4), 297-318.

