

 Global Center for
 Sustainable
 Digital Finance

Determinants of Using Digital Money

In partnership
with:



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Executive Summary

One of the core areas of the digital transformation in financial services is digital money. But the use of cash still dominates from a global perspective with more than eighty percent. This is in sharp contrast to many Asian or African countries where digital money has a greater relevance. However, there is still no empirical evidence of what factors determine the use of digital money. Nevertheless, this is an important field for financial inclusion, where the use of digital money has emerged as an enabler. To analyze the relevant factors of digital money usage this paper develops a research model based on eight hypotheses and tests it by using a data sample from Switzerland, representing a country with a high maturity in digitalization and the use of cash. From this data, five determinants to use digital money could be identified as significant: "performance expectancy", "social influence", "hedonic motivation", "perceived risk" and "perceived compatibility". The factors "perceived ubiquity", "effort expectancy" and "Swissness" could not be confirmed as significant.

1. Introduction

The digital revolution of financial services, which is very often termed as financial technology (short “fintech”), has emerged as a strategic area for both the incumbent organizations as well as the start-ups and encompasses innovative solutions that are enabled by IT ranging from payments and investments to financing (Puschmann, 2017). But despite the digitization of almost all areas of banking approx. 83% of all financial transactions globally were still in cash in 2016 (Williams, 2017). This number fell constantly over the past years but is still at a very high level in most countries (e.g., Japan (51%), Nigeria (62%), Spain (44%), Germany (39%), Mexico (39%), Saudi Arabia (39%)). Only a few countries like Norway or Sweden show a decline in cash transactions while most other countries show the opposite trend. In Sweden, for example, the circulation of cash has decreased by 50% between 2012 and 2020. This was mainly due to the popularity of the digital money solution Swish, which is already used by 63% of the population and has already reached a critical mass (EFMA, 2018). Swish is a digital money system launched in 2012 by the six Swedish banks Danske Bank, Handelsbanken, Länsförsäkringar, Nordea, SEB and Swedbank. Later, other banks like Skandia, Sparbanken Syd and ICA Banken joined the network, too. Other prominent examples of digital money success stories are China and Kenya (Monks, 2017). With the evolution of digital currencies, the typical functions of money as a unit of account, a medium of exchange and a store of value are increasingly unbundled (Brunnermeier et al., 2019). For example, Bitcoin serves the function as a medium of exchange in some countries of the world better than existing fiat currencies. In parallel to the evolution of cryptocurrencies, many countries have explored the use of fiat-backed digital currencies. This hybrid form of cryptocurrencies and central bank money are often termed as “central bank digital currencies” (CBDC) (Bank of England, 2020). Most recently

some central banks such as the Bank of England and the Swedish Riksbank started to experiment with CBDC, while the U.S. discusses the use of a “Digital Dollar”. China also works on its own digital currency, the Digital Yuan, which is designed as a centralized solution, but which is still used only rarely. This means that the digital currency is issued from the People’s Bank of China (PBOC) via the commercial banks to the consumers. Another important factor of the changing nature of payments is the evolution of fintech start-ups which increasingly disrupt the payment value chain. Examples are Chime, Digit, Varo, and Aspiration in the U.S., Monzo and Revolut in the U.K., Alipay and WeChat in China as well as NU Bank in Brazil, with most of them offering digital money solutions (McKinsey & Company, 2023). For example, the cost of an international payment transaction today is approx. \$25 – 35 and could in the future be around \$1-2. All these developments tend to favor digital payment solutions over cash payments. But the core question for most countries in the world with low user rates of digital money (which applies to most countries) is what determines the factors for the use of digital money? This paper aims to shed light on this question by developing a user-based model and empirically analyzing the determinants of usage. For this, the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) is used, extended and empirically analyzed at the example of Switzerland. In contrast to Sweden and China, however, Switzerland is still uncharted territory and by far has not yet reached a critical mass adoption.

The remainder of this paper is organized as follows: Section 2 gives an overview on the theoretical background and presents the research model. Section 3 develops the hypotheses while section 4 establishes the research context and data. Section 5 focuses on the empirical analysis. Finally, section 6 discusses the results and section 7 summarizes the findings.

2. Theoretical Background

2.1 Digital Money

Even though digital money was already considered as a means of payment when the first phones were introduced, it was only smartphones that made it more relevant and ultimately gave it a right to exist successfully alongside credit cards and cash (Ooi Wei and Yazdanifard, 2015). The worldwide penetration of smartphones and their intense use make them interesting for payments and a possible substitute for the physical wallet and cash (Mallat, 2007). Digital money is a general umbrella term that can be differentiated along at least two main categories: the communication technologies that are being used and the distance of usage: First, a transaction can take place either via a mobile network or via other wireless communication technologies like Near Field Communication (NFC) (Slade et al., 2015). Second, digital money can either take place as a remote digital money or as a proximity digital money. In other words, a distinction is made between whether the transaction is processed via a smartphone on the internet (remote digital money) or stationary (local/proximity digital money) (Chandra et al., 2010). Well-known examples of remote digital money are the purchases of apps via the Apple App Store or Google Play Store or transfers sent between individuals like peer-to-peer payments. With this, users can transfer or request money from other users. These apps differ from mobile banking in that they function quickly and without a long registration process. In both mobile commerce and money transfers, it is common for consumers to provide their account details in advance so that the inconvenience of a constant security survey on payment information can be avoided (Linck et al., 2006). In contrast to this, proximity mobile payment refers to digital money transactions in stationary retail stores. These so-called proximity digital money rely on the infrastructure of a retail store, which ensures that the transaction process runs smoothly. The mobile device

interacts with the retailer's point of sale (POS) system. This interaction between smartphone and POS system can use different technical variants. The two most used systems are based on NFC or Quick Response (QR) Code solutions. In this case the sales channel is the biggest difference between remote digital money and proximity digital money. A third category are so-called mobile wallets such as Apple Pay which offer the possibility to make proximity digital money as well as remote digital money. This type claims to replace the consumer's wallet completely. In a much simpler way, mobile wallets can organize different debit or credit cards or loyalty cards. Mobile wallets can also display and analyze all transactions in a much more transparent manner (Stokes, 2014). Therefore, they not only have a pure payment function, but also additional functions such as customer cards, coupons or digital sales slips. Such wallets can comprise fiat and cryptocurrencies.

2.2 Digital Money in Switzerland

This digitalization of consumer behavior suggests that digital money services could also be widespread in Switzerland but are still far from it. While in Sweden more than 7 million of the almost 10 million inhabitants use the digital money app 'Swish', in Switzerland only around 25% of the population use digital money solutions (Swiss Payment Monitor, 2025). In contrast to this, around 60% of all transactions in Switzerland are still settled in cash or by debit or credit card. This fact clearly demonstrates that the Swiss still favor cash or more conservative solutions like debit cards over digital money. Many providers recognize, therefore, the huge potential and are vehemently pushing into the digital money market in Switzerland:

- *Apple Pay*: Apple started its digital money service Apple Pay in Switzerland already in 2016. Payments are made either contactless using NFC technology at the payment terminal or via

in-app purchases. In addition to convenience for quick contactless payment, Apple Pay offers a more secure cashless payment option.

- *Google Pay*: Google entered the Swiss market in 2019. It can be used at NFC-equipped POS terminals. There are currently only the three issuers Cornèrcard, Bonus Card and Swiss Bankers which are partnering with Google. As with other solutions that require a third-party provider, consumers and merchants both pay fees when using Google Pay.
- *Samsung Pay*: Many Swiss credit cards and prepaid cards support Samsung Pay. Like Apple Pay, Samsung Pay cannot be linked directly to a Swiss bank account and merchants must pay fees to banks and card issuers. The major benefit of Samsung Pay is the magnetic secure transmission technology which uses the magnetic stripe of credit and debit cards. This allows consumers to use it at many POS terminals that are equipped with magnetic stripe readers.
- *TWINT*: The digital money provider TWINT evolved from a merger of TWINT (originally launched by PostFinance in 2015) and Paymit (originally launched by the companies SIX, UBS and Zürcher Kantonalbank in 2016) in 2016. TWINT focuses primarily on cashless payments via POS terminals which are equipped with a special TWINT beacon. Currently, approx. 2,300 stores in Switzerland offer both stationary and online payment. TWINT today is only targeted at the Swiss market and has no international scope like the other three aforementioned solutions.

It is not yet clear which payment solution will dominate the Swiss market medium-term or long-term. All solutions offer various benefits for the customer. However, it can be observed that digital money has not yet gained acceptance in Switzerland and debit card payments as well as cash still dominate the payments landscape.

2.3 Research Model

To identify potential determinants of digital money in Switzerland from a consumer perspective, behavioral research offers valuable research models. The roots of technology acceptance research date back to 1970s behavioral research. According to Venkatesh et al. (2003), Ajzen's theory of planned behavior (1991) is one of the most fundamental and authoritative theories of human behavior. However, in lieu of sketching the historical development from Ajzen's Theory of Reasoned Action to Venkatesh et al. (2012) Extended Unified Theory of Acceptance and Use of Technology (UTAUT2), this research focuses on the latter only. Yet, in order to be able to empirically explore the relevant usage factors of digital money, it is necessary to identify the determinants on the basis of theoretical constructs and thereby derive a specific theoretical framework. According to Li et al. (2014), it is widely accepted to use the Technology Acceptance Model (TAM) as a basis for digital usage studies and extend this theory accordingly. This model has already been adopted by many studies investigating technology adoption (Li et al., 2014). From this, Venkatesh et al. (2012) developed the UTAUT and UTAUT2 models as a framework that has its roots in the TAM model and places technology adoption in a consumer context.

Since the introduction of the UTAUT model by Venkatesh et al. (2003), it has been used in both an organizational and non-organizational context and has later been enhanced by the Extended Unified Theory of Acceptance and Use of Technology (UTAUT2) (Venkatesh et al., 2012). The focus of the extended model is the analysis of technology acceptance in a consumer context. The UTAUT2 framework has been chosen as the main basis for the theoretical foundation of this research because it already enjoys a high level of acceptance in technology adoption research (e.g. (Im et al., 2011), (Chang, 2012)). The UTAUT2 model serves as the basic framework for

the empirical research framework used in this research and is extended for the specific application of digital money in Switzerland in this context. According to Morosan and DeFranco (2016), many authors have used the core model of UTAUT2 by either removing key factors ((Lian, 2015), (Pascual-Miguel et al., 2015)) or adding additional constructs to the model ((Baptista and Oliveira, 2015), (Lian, 2015)). A study by Williams et al. (2011) concluded that many studies use only parts of the construct and only a small number apply the entire UTAUT model without considering the moderating factors (age, gender, experience).

Thus, in this research, the model was adapted to the specific requirements for the context of digital money. The key factor price value was omitted because the research field examined in this paper works via apps such as Apple Pay or TWINT, which are available free of charge.

According to Statista, 76.51 percent of the Swiss own a smartphone

(www.statista.com/statistics/568277/predicted-smartphone-user-penetration-rate-in-switzerland).

Therefore, the key factor price/performance ratio no longer seemed relevant for the empirical study. The habit factor was removed because digital money is still a very new technology, and it has not yet found such widespread use among consumers in Switzerland to create a habit (Oliveira et al., 2016). The very nature of digital money means that both money and personal data are involved and make payment a perceived risk. Irrespective of the security of digital money solutions, the feeling of security can be a usage-relevant factor for digital money. The key factor 'facilitating conditions' was slightly adapted and formulated more specifically in this paper. Venkatesh et al. (2003) define this key factor somewhat more broadly and paraphrase facilitating conditions as technical as well as social and organizational support in the application of the technology (Chang, 2012). This paper narrows down the term and only intends to deal with the perception of availability. This term is also known as 'ubiquity'. It describes the

omnipresent availability of a product or service and has been grasped as the most important feature of a mobile phone (Balasubramanian et al., 2002). The problem of the limited implementation of digital money by the merchants and thus the limited payment option reflects a market penetration problem. Therefore, the construct was adapted and only examines the perception of consumers as to whether digital money can be used everywhere and is available.

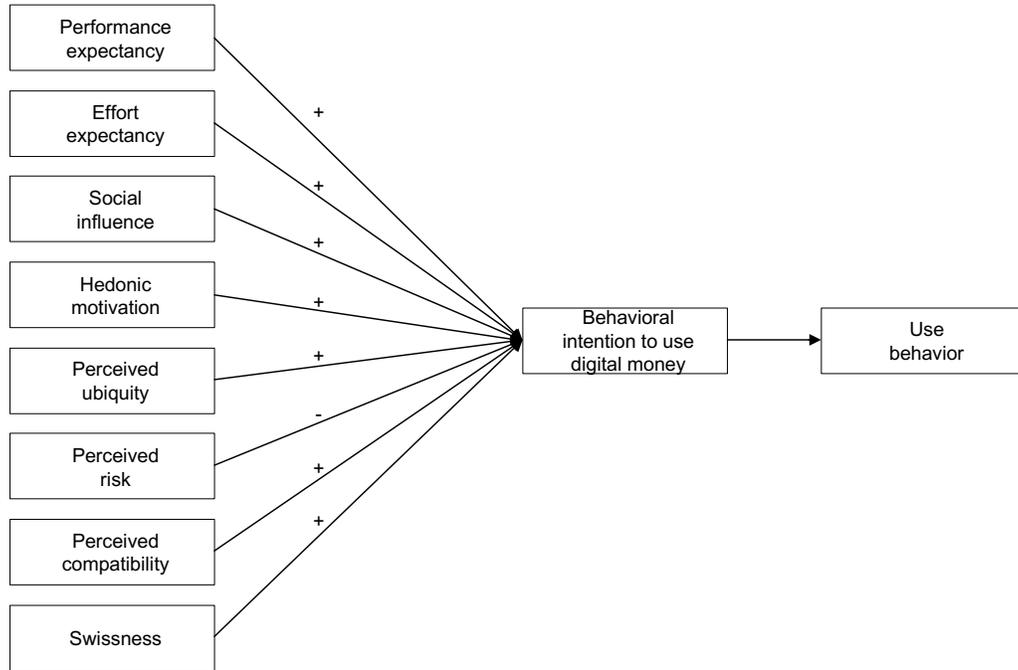


Figure 1. Research Model

The perceived compatibility with the consumer can be a decisive factor for digital money solutions that enable alternative payment options. Compatibility already has a strong significance with regard to the behavioral intention to use a new technology ((Oliveira et al., 2016), (Kim et al., 2010), (Kuo and Yen, 2009)). Consumers would be more likely to recognize the benefits of digital money if it fits their lifestyle. This goes hand in hand with the increasing use of smartphones, because if many activities are transferred to the smartphone, this automatically entails a lifestyle change and it does not seem to be far off doing an activity such as paying via the smartphone just because of the lifestyle. “Swissness” has its roots in country-of-origin

research which is a cultural factor. This cultural effect is examined as to whether customers would prefer to access digital money solutions or whether this factor plays a subordinate role in the behavioral intention of digital money use. This may also apply to an app such as TWINT, which aims to position itself against foreign providers. Figure 1 summarizes the research model for which the hypotheses are developed in section 3.

3. Hypotheses Development and Research Data

3.1 Hypotheses

All eight key factors are independent of each other and only affect the dependent variable. The dependent variable is the behavioral intention to use digital money and is intended to measure how strongly the individual hypotheses act as a usage-relevant factor for digital money. The individual hypotheses are presented and explicated in the following.

Performance expectancy: Venkatesh et al. (2012) define performance expectancy as the benefit of the technology for the consumer in carrying out certain activities. This definition is applied to digital money technology. Consequently, the performance expectancy is defined as the positive benefit that the consumer perceives for his activities when exercising digital money. This leads to the first hypothesis.

Hypothesis 1: The performance expectancy has a significant positive influence on the behavioral intention to use digital money.

Effort expectancy: Venkatesh et al. (2012) define it as the perceived ease of technology use for the consumer. If users have the feeling that the use of digital money is easy for them and the digital money solution is easy to use, they also have a positive behavioral intention to adopt this payment option. This leads to the second hypothesis.

Hypothesis 2: Effort expectancy has a significant positive influence on the behavioral intention

to use digital money.

Social influence: Social influence is defined as the degree to which a consumer perceives that important others believe they should use the technology (e.g. family, friends). According to Venkatesh et al. (2012), social influence reflects factors from the environment, such as the opinion of a friend, family or authority. If social attitudes towards digital money are positive, this can have a positive impact on the consumer's behavior and lead him/her to use digital money as well. This leads to the third hypothesis.

Hypothesis 3: The social influence has a significant positive impact on the behavioral intention to use digital money.

Hedonic motivation: Venkatesh et al. (2012) conceive hedonic motivation as the fun or pleasure consumers experience in using technology. Since digital money is a new exciting and entertaining way to pay, this could positively reinforce the user adoption of digital money. This leads to the fourth hypothesis.

Hypothesis 4: The hedonic motivation has a significant positive influence on the behavioral intention to use digital money.

Perceived ubiquity: The perception of availability measures the degree to which a consumer perceives that adequate infrastructure is in place to use the technology (Taylor and Todd, 1995). In the digital money context, it must therefore be possible for the consumer to pay with digital money at any POS. The stronger the infrastructure for digital money exists in Switzerland, the more consumers will use digital money. This leads to the fifth hypothesis.

Hypothesis 5: The perceived ubiquity has a significant positive influence on the behavioral intention to use digital money.

Perceived risk: The perceived risk indicates the extent to which the consumer is exposed to

certain financial, social, psychological or physical risks when using digital money. In particular, the protection of privacy and fear of hackers is important for consumers in the context of digital money (Zhang et al., 2012). For the more pronounced the consumer's perception is that digital money is or could be insecure, the more negative this will be for its use. This leads to the sixth hypothesis.

Hypothesis 6: The perceived risk has a significant negative influence on the behavioral intention to use digital money.

Perceived compatibility: Compatibility measures the extent to which innovation is consistent with values, needs and past experience (Rogers, 2003). Tornatzky and Klein (1982) already predicted in their study that compatibility is an important factor for consumer acceptance. Schierz et al. (2010) also added the construct 'perceived compatibility' to the study of digital money adoption. The more digital money and the consumer's lifestyle match, the stronger the consumer's intention to use digital money. This leads to the seventh hypothesis.

Hypothesis 7: Compatibility has a significant positive influence on the behavioral intention to use digital money.

Swissness: According to IPI (2017), the term “Swissness” refers to the designation “Swiss” as an indication of the geographical origin of goods and services. In addition, the term is used for values associated with Switzerland like precision, reliability and security. For example, more than 60% of Swiss people would pay more than double the price for Swiss food than foreign one (IPI, 2017). And a survey among international investors concluded that Swissness could be identified as an investment decision behavior (Bachmann and Hens, 2016). If such country-level characteristics are important, this raises the question whether consumers in Switzerland would also prefer a Swiss payment solution just as the Swedish favor a Swedish solution and the

Chinese a Chinese solution? This leads to the last hypothesis.

Hypothesis 8: Swissness has a significant positive influence on the behavioral intention to use digital money.

3.2 Research Context and Data

The collection of the data may stem from both primary and secondary data. The present study has collected secondary data for the theoretical part through a literature review. Literature based on technology acceptance was of particular interest here. The keywords for the search were “digital money”, “mobile money”, “digital money apps”, “technology acceptance” and “utaut”. From this search in EBSCO Business Source Complete and ABI/INFORM, AIS Electronic Library, INFORMS PubsOnLine, Springer Link, and Taylor & Francis Online, the theoretical framework was established. In addition to the theory, newspaper and internet articles were also researched that report on the current situation of the Swiss digital money market. Here the keywords were “TWINT”, “Paymit”, “Apple Pay”, “Samsung Pay” and “digital money switzerland”. In addition, a collection of primary data was maintained via the survey. The first question was which sections of the population were in demand. The entire Swiss population, who uses a smartphone and is therefore already technology-oriented, was considered for the study. The methodology of convenience sampling was chosen. According to Saunders et al. (2009), convenience sampling means selecting participants based on their availability and simplicity of accessibility and not trying to achieve a correct representation of the total population. To reach as many people as possible, the survey was first sent to friends and acquaintances via social media such as Facebook and LinkedIn. In addition, the survey was distributed in various forums. Mainly the page "Sharing is Caring" can be mentioned, which is a Facebook group for students at Swiss universities. To reach as many age groups as possible, the survey was also

distributed via e-mail to acquaintances who distributed it at their place of work. In addition, all participants were rewarded with a 2-for-1 voucher as an incentive to motivate them to participate in the survey. Before the survey was published, the questionnaire was sent to nine experts to check its content, comprehensibility, design and clarity. The feedback received was then processed accordingly. The time taken to complete the survey was measured and then communicated further. An introductory text was added at the beginning of the survey to arouse the participant's interest. Questions about personal characteristics were kept very brief and asked only by age, gender and place of residence so as not to deter too many participants. In the main part, an attempt was made to find a format that was as simple as possible, which would enable the survey items to be answered. Accordingly, Likert scales were used to measure the individual survey items. The scale ranged from "strongly disagree" (1) to "strongly agree" (7). Table 1 summarizes the factors.

Factor	Acronym	Statement	Reference
Performance expectancy	PE1	Digital money is a useful way to pay.	Venkatesh et al. (2012)
	PE2	With digital money I would be able to execute my financial transactions faster.	
	PE3	Using digital money would increase my productivity.	
	PE4	Using digital money would give me more convenience.	
Effort expectancy	EE1	The use of digital money is clear and understandable for me.	Venkatesh et al. (2012)
	EE2	It would be easy for me to develop the capabilities to use digital money.	
	EE3	I believe that using digital money is easy.	
Social influence	SI1	People who influence my behavior think that I should use digital money.	Venkatesh et al. (2012)
	SI2	People who are important to me think I should use digital money.	
	SI3	People who are important to me can help me to use digital money.	
Hedonic motivation	HM1	I enjoy using digital money.	Venkatesh et al. (2012)
	HM2	The use of digital money is pleasant.	
	HM3	The use of digital money is very entertaining.	

Perceived ubiquity	PU1	I find that only a few points of sale accept digital money.	Upadhyay and Jahanyan, (2016)
	PU2	An increase in outlets that accept digital money would increase the popularity of digital money usage among the population.	
Perceived risk	PR1	I don't feel entirely confident about providing my personal information to digital money applications.	Abrahão et al. (2016)
	PR2	I am concerned about the future use of digital money because third parties can access my data.	
	PR3	I do not feel protected from sending money via the digital money system.	
	PR4	There is a high probability that something will go wrong with the digital money system.	
Compatibility	C1	My lifestyle is compatible with digital money.	Schierz et al. (2010)
	C2	Digital money fits well with the way I buy products and services.	
	C3	I would appreciate paying with digital money instead of a credit card or cash.	
Swissness	S1	I would prefer Swiss digital money applications to foreign digital money applications whenever possible.	Bachmann and Hens (2016)
	S2	I trust Swiss digital money applications more than foreign digital money applications.	
	S3	I believe a national digital money application increases the popularity of digital money usage in Switzerland.	
Behavioural intention to use digital money	BU1	I intend to use digital money in the future.	Venkatesh et al. (2012)
	BU2	I intend to use digital money regularly in the coming months.	
	BU3	I will try to integrate digital money into my everyday life.	

Table 1. Indicators for measuring the Variables

4. Empirical Analysis and Results

4.1 Overview of the Sample

The descriptive analysis provides a brief overview of the participants in the survey before using multiple regressions to determine which factors are relevant for the use of digital money. A first analysis of the sample showed that the survey reached a total of 413 participants, 354 (85.7%) of whom answered the questions completely between February and May 2021. A cross-comparison

with similar studies and surveys shows an above-average value. This can be explained by the fact that the questions were kept very simple in 7-point Likert scales, and the survey forms could be completed within a maximum of five minutes. The data show a strong preponderance of male participants in the sample. Accordingly, 71.8% of all participants are male. The sample also shows a preponderance of young participants. Most of all respondents (60.5%) belong to the age category of 18-24 years. The second largest figure is the age category of 25-29 years. The other categories represent approximately the same number of participants, except for the 60+ category, which accounts for only 1.1% of the sample. The following explanations are conceivable for the strong representation of male participants aged 18-24: The survey was distributed primarily via student channels and the pages on social media through which the survey was placed may also have been visited predominantly by male students. A further explanatory approach could be the content of the survey, which may appeal to more male interested parties. Nevertheless, the focus on one age group is legitimate and various other digital money surveys have also been conducted in the same way (Xin et al., 2013). 58% of the participants responded that they have already used digital money while 42% stated that they haven't yet done so. In addition, 96% of all participants live in Switzerland and only 4% in other countries. This is not surprising since the survey was conducted in and focused on Switzerland.

4.2 Normal Distribution

First, the assumption of the normal distribution is checked. There is a significant deviation from the normal distribution from a skewness greater than 3.0 and a kurtosis greater than 8.0. The analysis shows that all variables meet the criteria (see Table 2). Consequently, no factor is excluded from the analysis.

Construct	Indicator	Average	Standard Deviation	Variance	Skewness	Kurtosis
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Performance expectancy	PE1	5.47	1.553	2.412	-0.995	0.5
	PE2	5.15	1.648	2.715	-0.673	-0.405
	PE3	4.31	1.771	3.135	-0.133	-0.92
	PE4	5.02	1.733	3.005	-0.66	-0.49
Effort expectancy	EE1	5.01	1.635	2.672	-0.516	-0.619
	EE2	5.99	1.338	1.791	-1.618	2.525
	EE3	5.67	1.374	1.887	-1.087	0.892
Social influence	SI1	3.41	1.89	3.574	0.304	-0.959
	SI2	3.3	1.927	3.714	0.408	-0.975
	SI3	3.89	1.838	3.379	-0.032	-1.056
Hedonic motivation	HM1	4.06	1.817	3.302	-0.119	-0.786
	HM2	4.72	1.71	2.925	-0.576	-0.312
	HM3	3.3	1.672	2.796	0.303	-0.536
Perceived ubiquity	PU1	4.26	1.577	2.486	-0.125	-0.602
	PU2	5.56	1.419	2.015	-1.005	0.567
Perceived risk	PR1	4.17	1.938	3.757	-0.135	-1.163
	PR2	4.42	1.885	3.551	-0.209	-1.101
	PR3	3.91	1.801	3.245	0.108	-1.026
	PR4	3.71	1.701	2.893	0.198	-0.848
Compatibility	C1	5.26	1.652	2.728	-0.932	0.18
	C2	4.83	1.807	3.267	-0.573	-0.588
	C3	4.27	2.014	4.058	-0.144	-1.182
Swissness	S1	4.77	1.951	3.807	-0.572	-0.828
	S2	4.9	1.822	3.321	-0.625	-0.584
	S3	4.86	1.755	3.078	-0.687	-0.298
Behavioral intention to use digital money	BU1	5.01	1.948	3.796	-0.776	-0.549
	BU2	4.07	2.196	4.822	-0.036	-1.436
	BU3	4.14	2.103	4.423	-0.125	-1.3

Table 2. Skewness and Kurtosis of Indicators

4.3 Reliability Analysis

After the survey items have been reviewed against their appropriateness for further investigation, the individual factors are checked for their significance. The constructs each combine several individual survey items and therefore a reliability analysis has to be carried out by Cronbach's Alpha. The value of Cronbach's alpha gives an estimate about the reliability of an individual factor and the whole model (Gliem and Gliem, 2003). In general, a Cronbach's alpha of over 0.7

points to a high reliability. The result of the reliability analysis in the following Table 3 shows both the Cronbach's alpha of the individual factors and of the entire model.

Factor	Cronbach's Alpha	Survey Item
Performance expectancy	.905	4
Effort expectancy	.807	3
Social influence	.855	3
Hedonic motivation	.854	3
Perceived ubiquity	.584	2
Perceived risk	.865	4
Compatibility	.882	3
Swissness	.848	3
Behavioural intention to use digital money	.945	3
Entire model	.894	28

Table 3. Internal Consistency and Cronbach's Alpha

Table 3 shows that all factors except one have an alpha above 0.8. This indicates that these factors are very reliable. The overall model also has a very high alpha of 0.894. Only the factor "perceived ubiquity" has a rather low alpha value of 0.584 and according to Bonett and Wright (2015) a weak reliability. Nevertheless, the alpha value tends to rate the reliability of scales higher the more survey items they contain (Sijtsma, 2009). For these reasons, the factor "perceived ubiquity" can be retained because it consists of only two survey items.

4.4 Explorative Factor Analysis

In a next step the suitability of the correlation matrix of the independent variables is examined. This is done using the Kaiser-Meyer-Olkin criterion. The examination of the Kaiser-Meyer-Olkin criterion yields a value of 0.891. The correlation matrix is therefore qualified for further analyzes and the validity of the measurement model is next checked using explorative factor analysis. For factor extraction, eight factors are extracted, since the theoretical framework also contains eight constructs (see Table 4). Furthermore, the cumulative variance calculated in this way reaches a value of 78.36%, i.e. all independent variables together account for 78.36% of the

initial variance, a value achieved is very satisfactory with at least 50%. A main axis analysis with Varimax rotation of the independent variables is subsequently carried out. The result is shown in Table 5. Almost all indicators can be assigned to the corresponding factors without contradiction and also have a high factor loading. Even if indicator "C3" for factor 1 has a slightly larger cross-loading with a value of 0.453, it was decided to retain this indicator. According to (Field, 2009), mild cross-loadings are no problem for factor analysis. Rather, one should concentrate on high correlations (greater than 0.8). Thus, the independent variables can be used in the subsequent multiple regression.

N = 354	Independent Variables							
	1	2	3	4	5	6	7	8
PE2	0.867	-0.026	0.189	0.177	0.008	0.082	0.136	0.129
PE3	0.787	-0.135	-0.01	0.261	0.058	0.255	0.113	0.103
PE4	0.761	-0.147	0.265	0.11	0.027	0.232	0.229	0.115
PE1	0.704	-0.125	0.371	0.134	0.05	0.131	0.291	0.113
PR2	-0.087	0.872	-0.095	-0.02	0.057	-0.115	-0.061	0.008
PR3	-0.101	0.822	-0.181	-0.055	0.067	-0.079	-0.191	-0.016
PR1	-0.047	0.802	-0.003	-0.024	0.098	-0.089	0.07	-0.057
PR4	-0.1	0.799	-0.082	-0.039	0.024	0.031	-0.163	0.004
EE3	0.195	-0.117	0.819	0.073	0.016	0.157	0.152	0.076
EE2	0.103	-0.062	0.808	0.125	0.086	0.007	0.221	0.165
EE1	0.258	-0.201	0.706	0.09	0.033	0.284	-0.001	-0.045
SI2	0.24	-0.114	0.053	0.861	0.012	0.207	0.179	0.043
SI1	0.238	-0.104	0.016	0.833	0.046	0.193	0.239	0.013
SI3	0.091	0.059	0.218	0.79	0.104	0.058	-0.127	0.056
S2	0.028	0.117	0.016	0.019	0.917	0.029	-0.022	-0.005
S1	0.011	0.067	0.093	0.092	0.906	0.029	-0.022	-0.022
S3	0.055	0.049	0.012	0.034	0.764	-0.001	0.183	0.272
HM3	0.112	-0.064	0.047	0.231	0.013	0.836	0.134	0.073
HM1	0.33	-0.136	0.248	0.143	0.037	0.757	0.175	0.142
HM2	0.365	-0.096	0.363	0.115	0.039	0.638	0.203	0.148
C1	0.32	-0.142	0.263	0.086	0.121	0.177	0.75	0.131
C2	0.375	-0.214	0.241	0.138	0.049	0.281	0.708	0.076
C3	0.453	-0.232	0.119	0.194	-0.005	0.352	0.534	0.147
PU1	0.142	0.009	0.016	0.048	0.12	0.163	-0.006	0.868
PU2	0.234	-0.085	0.288	0.057	0.087	0.075	0.309	0.652

Table 4. Varimax rotated Factor Loading Matrix of independent Variables

The factor loading check for the dependent variable "Behavioral intention to use digital money" also shows a high factor loading and can therefore be measured by the individual indicators (see Table 5). Thus, the dependent variable may be used in multiple regression. All in all, the model quality is hence confirmed.

N = 354	Dependent variable
	1
BU1	0.943
BU2	0.946
BU3	0.961

Table 5. Factor Loading Matrix of the dependent Variable

4.5 Multiple Regression

The prerequisites of the multiple regression analysis are met with a linearity check, the conditional expected value check, the multicollinearity check, the check for autocorrelation, the homoscedasticity check and the test for normal distribution of residuals:

- *Linearity check:* The linearity could therefore be checked by creating the partial scattering diagrams and viewing them graphically. Thus, it could be proven that there is a linear relationship between an independent variable and the dependent variable.
- *Conditional expected value check:* This condition requires that the regressors must not correlate with the disturbance variable, otherwise this is an error in the development of the model. Because the research model is based on Venkatesh's UTAUT model and the factors have also been verified by an exploratory factor analysis, the factors selected here can be considered reliable.
- *Multicollinearity check:* Multicollinearity is present when two or more variables have a high degree of linear correlation. One way to identify multicollinearity is to examine the correlation matrix of all independent variables for values higher than 0.80 or 0.90 (Field, 2009). The analysis shows that there are no excessive correlations. Nevertheless, the

independent variables "C" and "PE" have an unusually high collinearity with a value of 0.719, which needs further investigation. The Variance Inflation Factor (VIF) may provide further evidence that multicollinearity may prevail in the model. In general, a VIF of 10 or greater can be considered problematic in terms of multicollinearity (Field, 2009). Related to the VIF is the tolerance statistic, which represents the reciprocal ($1/VIF$). Values lower than 0.1 should cause serious concern and values lower than 0.2 should also be considered with concern. The further analysis of the data shows that none of these limits are exceeded or undershot, indicating that there is no multicollinearity.

- *Check for autocorrelation:* Autocorrelation occurs mainly in time series data, this is not the case in the following study. Nevertheless, a Durbin-Watson test was applied and a value of 1.874 was reached. According to Field (2009), this value speaks for independent error values.
- *Homoscedasticity check:* Homoscedasticity exists when the error is constant for each value of the predicted dependent variable. In contrast, heteroscedasticity can be presumed if the scatterplot has a clearly recognizable pattern (Field, 2009). For this, a Breusch-Pagan test was performed to statistically prove or disprove heteroscedasticity. The result of the Breusch-Pagan test shows statistically that heteroscedasticity is present in our model.
- *Test for normal distribution of residuals:* The last premise of the regression model is that residuals should be approximately normally distributed. This can best be assessed graphically using a histogram of the standardized residuals. It could be shown that there is an approximate normal distribution.

The selected method input in SPSS was hierarchical regression. The variables were introduced in different blocks, which SPSS includes in the model one after the other. This has the advantage that the change in the regression coefficient can be observed by including certain additional

variables. In a first block, the variables already examined in the existing literature were added: Performance expectancy, perceived ubiquity, social influence, hedonic motivation, perceived risk and perceived compatibility. In the second block the factor effort expectancy was added and in the third block the factor “Swissness”. For reasons of clarity of work, model 3 is reported, in which all factors were considered.

Table 6 shows that the corrected R² of the model is 0.7168. This means that 71.68% of the total variance of the variable "behavioral intention to use digital money" is explained by the eight regressors. With an R² value of 71.68%, a large effect can be assumed. This is not surprising, as this model is based on the UTAUT model and is the result of extensive literature research. The R² value did not increase significantly after each block was inserted. This implies that the added variables "effort expectancy" and "Swissness" contribute very little to the overall variance.

Model	R ²	Corrected R ²	Change statistics			
			Change in F	df1	df2	Sig. change in F
3	0.7228	0.7168	179.3432	8.0000	345.0000	.0000

Table 6. Model Summary of the Multiple Regression of the eight IVs with the DV "Behavioral Intention to use Digital money"

The ANOVA evaluation in Table 7 shows the F-test.

Model		Squared sum	Df	Average of squares	F	Significance
3	Regression	998.818	8	124.852	112.45	.000
	Non-standardized residuals	383.05	345	1.11		
	Total	1381.868	353			

Table 7. ANOVA Table of the eight IVs with the DV "Behavioral Intention to use Digital Money"

The F statistic shows whether the coefficient of determination R^2 is random. The significance level of the F-value is checked. With a significance of 0.000, R^2 is highly significant, which means that there is a relationship between the eight independent variables and the dependent variable and that it is not created by chance. In the following, the regression coefficients are examined. As can be seen in Table 8, five of the eight independent variables are significant (significance level of 5%) and can therefore be assumed for this study model. The rejection of the factor "perceived ubiquity" is unusual in that it also originates from Venkatesh's UTAUT model and has been tested in many other studies. The factors "effort expectancy" and "Swissness" are based on the literature but were created exploratively to see whether these variables could also have an influence on the DV. These factors have been refuted; they therefore have no significant influence on the "behavioral intention to use digital money". Looking at the significant factors, the factor "perceived compatibility" has the greatest influence with a beta of 0.319, ahead of the factor "performance expectancy". The negative beta of the factor "perceived risk" is understandable, since an increased perception of risks has a negative effect on the intention to use digital money. This also applies in a positive sense to the betas of the other significant factors.

Model 3	Non-standardized coefficients		Standardized coefficients	T	Significance
	Regression coefficient B	Standard error	Beta		
Constant	-0.431	0.456	-	-0.9452	0.3452
Performance expectancy	0.3949	0.085	0.291	4.6451	0
Effort expectancy	0.0425	0.0653	0.027	0.651	0.5155
Social influence	0.1096	0.0444	0.091	2.4692	0.014
Hedonic motivation	0.3	0.0557	0.23	5.3886	0

Perceived risk	-0.1683	0.0434	-0.132	-3.8808	0.0001
Perceived compatibility	0.3841	0.0638	0.319	6.0164	0
Perceived ubiquity	-0.0416	0.056	-0.027	-0.7438	0.4575
Swissness	0.0113	0.0389	0.009	0.2905	0.7716

Table 8. Regression Coefficients

The premises of the regression model are fulfilled to the extent that heteroscedasticity-consistent estimators were used to carry out the regression. Otherwise, no adjustments or limitations of the study model had to be made. The implementation of multiple regression results in a very high variance explained (value of R^2) of the investigation model of 72.28%. This means that 72.28% of the variation of the "behavioral intention to use digital money" can be explained by these independent variables. This suggests that the choice of Venkatesh's robust UTAUT model as the basis for our investigation was the right decision. An attempt was also made to incorporate other existing factors into the model that could influence the use of digital money and thus increase the value of R^2 .

5. Discussion

In total, five of the eight independent variables and their hypotheses can be confirmed significant: "performance expectancy", "social influence", "hedonic motivation", "perceived risk" and "perceived compatibility". The factors "perceived ubiquity", "effort expectancy" and "Swissness" are not significant, so their hypotheses must be rejected. The research setup has provided a robust model, with one exception (perceived ubiquity). This is astonishing as other studies identified this factor as relevant. One explanation could result from pointing to the data set which predominantly includes male participants aged between 18 and 25 years. Of the confirmed significant factors, the factor "perceived compatibility" has the strongest positive influence on the intention to use digital money. This is followed by the performance expectancy

factor, which also has a positive effect on the use of digital money. The factors "hedonic motivation" and "social influence" also have a positive effect; only the factor "perceived risk", as reasoned beforehand, has a negative effect on the behavioral intention to use digital money.

Hypothesis 1: The performance expectancy has a significant positive influence on the behavioral intention to use digital money.

With a significance of 0.000 ($p < .05$), the performance expectancy has a significant influence on the behavioral intention to use digital money and is, therefore, one of the usage-relevant factors for digital money. With a beta of 0.291 and a regression coefficient of 0.3949, it also has a positive influence and, therefore, we accept hypothesis 1. As anticipated, performance expectancy has the second largest effect on the use of digital money. If the relative advantage of digital money over other payment solutions is not noticeable to the consumer, then digital money cannot prevail.

Hypothesis 2: Effort expectancy has a significant positive influence on the behavioral intention to use Digital money.

With a significance of .5155 ($p > .05$), effort expectancy does not have a significant influence on the behavioral intention to use digital money and belongs therefore not to the factors relevant for use. Hypothesis 2 is, in other words, rejected. Surprisingly, effort expectancy has no significant influence on the use of digital money. In Switzerland, this could be related to the fact that most potential users are already familiar with the concept of apps. This implies that consumers are so competent in dealing with new technologies or, in this case, mobile applications that it no longer influences their attitude towards the use of digital money. The apps must certainly be easy to learn and user-friendly, but this alone does not increase the use of digital money in Switzerland.

Hypothesis 3: The social influence has a significant positive impact on the behavioral intention to use digital money.

With a significance of 0.0140 ($p < .05$), the social influence has a significant influence on the behavioral intention to use digital money and therefore belongs to the use-relevant factors. With a beta of 0.091 and a regression coefficient of 0.1096 it also has a positive influence and therefore we accept hypothesis 3. The confirmation of the hypothesis of social influence means that the opinion and recommendation of influential consumers control the use of digital money to a certain degree. Users are thus influenced by their social environment to use digital money. It would be interesting to see how one could capitalize on this insight. TWINT, for example, has taken a step in the right direction with the function that users can send small amounts to friends without much effort. Such social aspects of the application can, of course, strengthen the social influence. The Venmo digital money app in the U.S. is the best example of how the "social impact" factor can be exploited. Venmo has realized that implementing a social media feed can turn digital money into an innovative and social experience such as Facebook or Twitter.

Hypothesis 4: The hedonic motivation has a significant positive influence on the behavioral intention to use digital money.

With a significance of 0.0000 ($p < .05$), the hedonic motivation has a significant influence on the behavioral intention to use digital money and therefore belongs to the use-relevant factors. With a beta of 0.230 and a regression coefficient of 0.3000 it also has a positive influence and thus hypothesis 4 can be confirmed. The study has shown that hedonic motivation is among the central usage-relevant factors for digital money. Thus, the finding applies to digital money solutions in Switzerland that digital money adoption can be increased not only by increased usefulness, but also by the entertainment factor. TWINT, for example, has hesitantly started with

loyalty points, but they do not yet offer an entertaining experience in the true sense of the word. Digital money should not only be useful but also offer a fun user experience. Again, the Venmo app from the U.S. can be cited as an example. What makes Venmo so unique is that it not only enables digital money but also makes transactions visible to other users. For example, a user's transaction feed can be used to see personal activities throughout the day, which reads and interacts like a Facebook feed.

Hypothesis 5: The perceived ubiquity has a significant positive influence on the behavioral intention to use digital money.

With a significance of .4575 ($p > .05$), the perceived ubiquity has no significant influence on the intention to use digital money and is therefore not one of the use-relevant factors for digital money. Hypothesis 5 is, put differently, rejected. There could be two reasons why the perceived ubiquity has no significant effect on the behavioral intention to use digital money. In contrast to countries such as India, where the same factor was investigated, there are already many POS in Switzerland that enable payment with digital money. NFC interfaces are available in most card terminals, and the large retailers offer them as well. Another reason for the non-significance of the hypothesis could be that consumers do not know at all where digital money is already possible. This would imply that digital money providers would have to inform the merchants about the payment function together with the merchants. This could be through vouchers that are issued when shopping or targeted information at the payment points.

Hypothesis 6: The perceived risk has a significant negative influence on the behavioral intention to use digital money.

With a significance of 0.0001 ($p < .05$), the perceived risk has a significant influence on the behavioral intention to use digital money and is, therefore, one of the factors relevant to use.

With a beta of $-.132$ and a regression coefficient of $-.1683$, it also has a negative influence and therefore we accept hypothesis 6. The study has shown that the perception of risk has a negative effect on the use of digital money, but this is not as strong as feared. This implies that concerns about payment risks may not be central but still relevant. Nevertheless, it is important for digital money applications, especially in Switzerland, to communicate security clearly and to show security features prominently and in a positive way in order to gain the consumer's trust.

Hypothesis 7: The perceived compatibility has a significant positive influence on the behavioral intention to use digital money.

With a significance of 0.0000 ($p < .05$), the perceived compatibility has a significant influence on the behavioral intention to use digital money and therefore belongs to the use-relevant factors for digital money. With a beta of 0.319 and a regression coefficient of 0.3841 , it also has a positive influence and thus we accept hypothesis 7. Already in the study by Schierz et al. (2010), the perceived compatibility was identified as the strongest factor for the use of digital money. This finding is reinforced by the study at hand. Due to its large effect, it is self-explanatory that digital money solutions in Switzerland should try to exploit this factor as much as possible. Before potential users even consider digital money as a payment method, digital money must be compatible with the behavior patterns of the user. This is probably also the case for many consumers. Many people may not feel the need to use digital money because they have an information deficit, although this technology corresponds to their values, needs and lifestyle. This group should be identified and informed about the usefulness of digital money. There are also many people who would like to use digital money instead of cash or credit cards as a payment method, but who see almost no possibilities to do so. Apple is already trying to sell all its products as a "lifestyle"; that's part of the global strategy, so it's not far off including Apple

Pay here as well. TWINT, on the other hand, has a bit more difficulty because they don't have a product like an iPhone and can't sell in the same way. This can only be achieved through a smart narrative and marketing campaign that reaches the right target group.

Hypothesis 8: "Swissness" has a significant positive influence on the behavioral intention to use digital money.

With a significance of .7716 ($p > .05$), "Swissness" has no significant influence on the intention to use digital money and is therefore not one of the usage-relevant factors for digital money.

Hypothesis 8 is thus rejected. This means that a Swiss payment solution is by no means a reason for consumers to switch to digital money. This implies, for example, that the TWINT solution competes with other solutions like Apple Pay or Samsung Pay. Surprisingly, this is in sharp contrast to other countries like Sweden, China or India where people prefer domestic providers rather than international ones like Apple Pay or Google Pay.

6. Conclusion

This paper develops a research model which analyzes the use of digital money solutions in a country where cash is still very dominant. With this, it contributes to digital service acceptance research in general and digital money specifically by applying the UTAUT2 model as a starting point for investigating digital money technology adoption. At the same time, the model is complemented by constructs of other acceptance theories, from which the eight hypotheses were derived. These variables were identified as potentially relevant factors for the intention to use digital money by deriving them from the relevant literature. Using a quantitative survey, the theoretical framework was examined by descriptive analysis and multiple regression. The analysis reveals that the factor perceived compatibility has the strongest effect on the behavioral intention to use digital money in Switzerland. The use of digital money is additionally strongly

influenced by the factors performance expectancy, hedonic motivation, perceived risk and social influence, all of which can be supported by the analysis. The three factors effort expectancy, perceived ubiquity and the cultural factor “Swissness” are not significant and are therefore refuted. Table 9 summarizes the results.

The results indicate that factors like product design and branding matter more than infrastructure expansion and that communication strategies should emphasize lifestyle integration rather than security or ubiquity alone.

Hypothesis	Result
H1: The performance expectancy has a significant positive influence on the behavioral intention to use digital money.	Confirmed
H2: Effort expectancy has a significant positive influence on the behavioral intention to use digital money.	Rejected
H3: The social influence has a significant positive impact on the behavioral intention to use digital money.	Confirmed
H4: The hedonic motivation has a significant positive influence on the behavioral intention to use digital money.	Confirmed
H5: The perceived ubiquity has a significant positive influence on the behavioral intention to use digital money.	Rejected
H6: The perceived risk has a significant negative influence on the behavioral intention to use digital money.	Confirmed
H7: The perceived compatibility has a significant positive influence on the behavioral intention to use digital money.	Confirmed
H8: “Swissness” has a significant positive influence on the behavioral intention to use digital money.	Rejected

Table 9. Summary of Results

In summary, this research contributes to a better understanding of the use of digital money as one of the future core elements of the so-called “Internet of Value” (Visconti, 2020) and helps to understand which factors consumers require as relevant for this. The theoretical model developed for this has proven to be of good quality, which provides the potential that the model can also be used for future research in a different environment. As cash is still the dominant payment method worldwide, the results may hold promising conclusions for other countries as well. The research was targeted at Swiss consumers and perhaps precisely because of this could help put into question some constructs that were still significant in other studies. This amounts to an important

significance and implies that the constructs should be studied in as many different contexts and countries as possible to observe which factors react to the cultural and economic conditions of a population and which are resistant, respectively.

However, the paper at hand also has some limitations. First, there are limitations regarding the sample. Since the 'convenience sampling' method was used to collect data, it was not possible to compile a representative sample of the population. Most of the participants were 18-25 years old and male, which suggests a homogeneous sample in the demographic structure and limits a generalization of the sample. It must also be considered that the sample has a Western cultural background and was conducted in an industrialized nation. This could significantly affect the factors for digital money and opens avenues for further research to widen the demographic base as well as extend it to other countries and cultures.

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