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Scale Construction For Measuring Millennials Perception Towards Cryptoverse Based On Identified Factors

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ABSTRACT

Purpose *– This paper aims to develop and validate a scale for measuring Millennials' perceptions of the cryptoverse, focusing on constructs such as Expected Benefits, Expected Longevity, Expected Use, Psychographics, Subjective Norms and Risk Appetite.*

Design/methodology/approach *– The scale development process involved several stages. A pool of items was generated to represent each construct, followed by expert reviews for clarity and relevance. An exploratory factor analysis (EFA) was conducted to assess unidimensionality, convergent validity, and discriminant validity of the constructs. Reliability was evaluated using Cronbach's alpha, composite reliability, and average variance extracted (AVE), with data collected from 150 Millennials.*

Findings *– The results confirm that the scale is reliable and valid for measuring Millennials' perceptions of the cryptoverse. Constructs such as Expected Benefits and Psychographics showed strong internal consistency, while Expected Longevity and Subjective Norms exhibited moderate reliability, suggesting the need for further refinement. The EFA confirmed the distinctiveness of the constructs, although some overlap was noted between Expected Longevity and Psychographics. The scale provides valuable insights into how Millennials assess the cryptoverse, considering factors like perceived benefits, longevity, and social influences.*

Research limitations/implications *– The sample was limited to Millennials, which may not fully represent the broader population. Future studies could expand the sample and incorporate longitudinal or qualitative approaches for a more comprehensive understanding of perceptions.*

Practical implications *– This scale helps businesses in the cryptoverse space align their products with Millennials' expectations, improving adoption rates.*

Originality/value *– This study introduces a reliable measurement tool for Millennials' perceptions of the crypto verse, offering valuable insights for both researchers and practitioners.*

Keywords: *Cryptoverse, Millennials, Perceptions, Scale development, Blockchain, Digital currencies.*

INTRODUCTION

The Indian crypto-verse, defining the developing ecosystem of cryptocurrencies, blockchain technologies, and other digital financials in India, has undergone substantial changes in the last decade. Cryptocurrency, till then a highly speculative and niche form of asset class, has been growing steadily and catching the attention of the public and the private sector alike, directly influencing its financial atmosphere [1]. By 2023, India will be one of the fastest-growing markets for adopting crypto globally, dropping about 10 million users holding digital assets according to the Chainalysis Global Crypto Adoption Index 2022. Some of those pinched adoptive factors include the democratization of financial services, a juicy round of high returns, and increasing awareness of decentralized finance or DeFi and blockchain technology. Amongst the major demographic arms propelling this adoption tsunami, it is the millennials aged between 25 and 40 who are extremely overwhelming [2]. Technically savvy in their own right, any system of finance, apart from traditional banking, is a big canvas that outlines their systematic change in perceptions. In India, a large chunk of cryptocurrency investors is made up of millennials. A survey conducted by the India Blockchain Alliance in 2022 shows that in India, almost 55% of its cryptocurrency users are aged between 25 and 40 years[3]. This is a generation born, nursed, and nurtured with ample access to the internet, smartphones, and drying cash economies, thus indeed a segment that is more susceptible to trying out newer experimental forms of currency like Bitcoin, Ethereum, and the new-alts [3]. Millennials look at cryptocurrency adoption as some sort of hedge against inflation and the devaluation of fiat currency amidst a

backdrop of traditional financial institutions and regulatory agencies not very quick to adapt or align themselves with the digital currency [4]. Moreover, decentralization and control over personal wealth hold a great attraction for that particular generation-which certainly has a strong preference for personal financial independence and the safeguarding of privacy. Still, while the setting looks almost favorable for India to enter the crypto verse, with all its growth opportunities, some drawbacks were dealing with regulatory uncertainty and ongoing concerns regarding digital asset safety that continued hampering the progress towards adaptation [5].

1.1 Millennials and Their Relationship with Cryptocurrencies

Millennials, often regarded as the "digital native" generation, grew up in the context of rapid technological advancements. They thus find themselves in sync with the latest trends [6]. In their lives, they have seen the rise of the internet, smartphones, social media, and even more recently, cryptocurrencies. Millennials have, therefore, been comfortable interacting with technology and using digital platforms since the onset of cryptocurrencies, making them the ideal fit for emerging financial tools [7]. The decentralized drawback for centuries of these cryptocurrencies; Bitcoin, Ethereum, and others causes them to lose their importance against matured traditional banking systems. As this generation of adults becomes more financially independent, cryptocurrencies offer a gateway that enables Millennials to become involved in the financial world by providing them a state of autonomy and control over their money not necessarily offered by traditional institutions [8]. Dissatisfaction with conventional financial systems is a major factor for the millennials' adoption of cryptocurrencies. This generation, coming of age during the Great Recession of 2008, has seen the drawbacks of centralized financial institutions. The attention from these members such as the dissimilarity in wealth, inflation, and underrepresented forces for traditional banking systems has hit this stage of people with a belief of seeking decentralized means for cryptocurrencies present themselves [9]. Apart from serving as vehicles for investment, cryptocurrencies appeal to millennials due to their ability to sidestep middlemen like banks and bureaucrats, providing a sense of financial freedom and independence in transactions, storages of wealth, and investment outside the ambit of what first happened [10].

For millennials, the privacy and security afforded by cryptocurrencies come hand in hand. In a world worried about data privacy, fuelling transactions without disclosing personal information becomes a matter of attraction. Cryptocurrencies offer a tempting level of anonymity to those in a society where data breaches, identity theft, and surveillance are growing worries. Unlike traditional financial transactions wherein personal details and third-party verification are necessary for a transaction, cryptocurrencies afford much more secrecy in monetary exchanges [11]. This sense of privacy coincides with millennial concerns about control over their personal information and digital footprints. Beyond privacy and decentralization: Investment-based opportunities for millennials identified with cultures of engaging their own plans. As a generation, they've simultaneously dealt with economic challenges from rising student debt and housing costs. Due to an increasingly strained stock and bond market for millennials, multimedia has turned their heads toward cryptocurrencies as an alternative platform for investing. As cryptocurrencies show great asset class growth potential alongside the global growth of digital asset markets, the demand for an alternative has picked up [12]. The growth of decentralized finance (DeFi), the non-fungible tokens (NFT), and crypto acceptance are becoming more pronounced; they add a sense of legitimacy and profitability to cryptocurrency. Some millennials see cryptocurrencies as speculative assets; others see them as a long-term store of value, especially as traditional currencies based on fiat lose their value due to inflation [13]. Cryptocurrencies could provide a whole new asset class viewed not just by the millennials as investments but also in the movement as a whole for greater self-control, transparency, and security in personal finances. It signifies the coming disruption to a standing financial arena; it represents new ways for transacting, saving, and investing, which definitely speaks to a generation keen on independence and invention in every aspect of their lives[14]. The role that millennials can play in the future of finance is ongoing, and their burgeoning relationship with cryptocurrencies conveys their longings for financial autonomy and a more equitable yet decentralized economy [15].

1.2 Regulatory Challenges in India's Crypto Landscape

The regulatory environment surrounding cryptocurrencies in India has been marked by significant uncertainty, with a lack of clear and comprehensive legal frameworks for cryptocurrency trading and investments. This ambiguity has been one of the key challenges for both crypto users and investors in India, particularly millennials

who are keen on engaging with the emerging digital asset market [16]. While cryptocurrencies like Bitcoin and Ethereum have gained substantial popularity, their legal status in India has remained a subject of debate and scrutiny. For many years, there has been no clear legislation that provides guidance on whether crypto assets are considered legal or illegal [17]. This has created an atmosphere of confusion, preventing many potential investors from entering the market and leaving existing players with concerns about the future of their investments. The absence of a regulatory framework has led to a series of conflicting statements from various government bodies. The Reserve Bank of India (RBI) has historically shown skepticism toward cryptocurrencies, even going so far as to issue a banking ban in 2018 that prohibited banks from providing services to cryptocurrency exchanges. Although the Supreme Court of India lifted this ban in 2020, the legal status of crypto assets remained uncertain. This lack of clarity has meant that investors and businesses in the crypto sector have faced a great deal of uncertainty, without knowing if or when future regulations might emerge [18].

In response to growing concerns and increasing adoption of cryptocurrencies, the Indian government has been actively considering legislative measures to regulate this sector. One of the major developments in this regard is the introduction of the Cryptocurrency and Regulation of Official Digital Currency Bill, which has been discussed and debated in the Indian Parliament [19]. The proposed bill, however, has raised concerns as it suggests a potential ban on private cryptocurrencies, while proposing the creation of a central bank digital currency (CBDC), backed by the Reserve Bank of India (RBI). The bill aims to establish a regulatory framework for digital currencies, addressing issues such as investor protection, financial crime prevention, and money laundering. However, the potential ban on private cryptocurrencies has led to significant uncertainty within the market, with investors unsure whether their existing crypto holdings will be legally recognized or subjected to penalties. These regulatory debates and the lack of a coherent policy framework have impacted the overall market sentiment [20]. For millennials, who are among the most active participants in the cryptocurrency space, these regulatory uncertainties have dampened confidence in the sector. While millennials are generally enthusiastic about investing in digital assets, their engagement is often tempered by concerns over the potential for sudden regulatory crackdowns [21]. Many are hesitant to make significant investments or build long-term portfolios in an environment where legal clarity remains elusive. Investors in India, particularly young, tech-savvy millennials, are wary of the potential for sudden shifts in policy that could negatively affect the value of their investments or lead to legal challenges. The lack of a stable and predictable regulatory environment has also hindered the development of India's crypto ecosystem. Cryptocurrency exchanges, block chain startups, and investors are reluctant to make long-term commitments when the regulatory landscape remains in flux. This hesitation also extends to institutional investors, who are waiting for clear guidelines before allocating substantial resources into the crypto market. This uncertainty has not only limited India's potential to become a global leader in cryptocurrency innovation but also affected the confidence of investors, making the Indian market less attractive compared to other countries that have established clear regulatory frameworks [22].

Table 1.1 ***Comparison of Regulatory Challenges in India's Crypto Landscape***

Regulatory Aspect	**Current Status**	**Impact on Market and Investors**
Legal Framework for Cryptocurrencies	No clear, comprehensive law; conflicting opinions from government bodies.	Confusion among investors about the legal status of cryptocurrencies, leading to hesitance in market participation.
Ban on Crypto transactions by RBI (2018-2020)	The RBI's banking ban was lifted by the Supreme Court in 2020.	Short-term market slowdown; investors feared losing access to banking services for crypto transactions.
Proposed Cryptocurrency and Regulation Bill	The bill suggests regulating and possibly banning private cryptocurrencies, with provisions for a Central Bank Digital Currency (CBDC).	Uncertainty about the future of private cryptocurrencies and potential loss of investment security for millennials.

Taxation of Cryptocurrencies	No clear tax framework, though there are indications that crypto transactions may be taxed.	Lack of clarity on tax implications leads to confusion for both investors and crypto exchanges.
Regulatory Oversight of Crypto Exchanges	Some exchanges operate without clear regulatory guidelines, leading to varying levels of compliance.	Lack of confidence in exchange security, risk of fraud, and scams; reduces trust among new investors.
Protection Against Fraud and Scams	No standardized regulation for consumer protection or fraud prevention.	Increased vulnerability to scams and fraud, leading to a lack of trust, especially among millennial investors.
Global Comparisons	Many countries (e.g., the U.S., UK, and Japan) have clear regulations and frameworks for crypto trading.	India risks falling behind other nations that offer more regulatory clarity, hindering crypto adoption.

2. LITERATURE REVIEW

Ashish Ranjan et.al (2024) this study explores how national rules have impeded the development of the cryptocurrency industry in the nation. The Indian government has resisted regulating cryptocurrency trading despite its recent notable development and appeal to investors, citing issues with security, terrorism, and possible effects on the country's currency. Clovia Hamilton et.al (2024) This study addresses how cryptocurrency can be a more sustainable alternative to traditional banking. traditional community financial institutions and how traditional currencies can morph by embracing digital financial technology. Financial institutions can remain relevant in the face of digital asset and cryptocurrency innovations. Ten recommendations for cryptocurrency policies and legal regulations were gleaned from this bibliometric study. Shailak Jani (2018) explores the users' confidence of dealing with cryptocurrency in a time that using such virtual money is not fully controlled and regulated. Besides, the paper is aimed to measure the spread of cryptocurrency use to have a clear picture from the practical view. The paper also analyses the way in which 21 different countries have responded in terms of regulations & legislations towards cryptocurrencies to develop a clear picture of its impact on various laws in India in order to regulate it.

Prof. Blesson James et.al (2018) Cryptocurrency is an innovative concept of decentralized virtual currency. It has turned out to be a new avenue of investment instrument in India similar to gold. Even though the government hasn't formulated any regulatory body or legislation with regards to cryptocurrecny trading and transaction in India, the government restricts the buy and sell of cryptocurrencies like bitcoin, litcoin, etc. Cryptocurrencies raises various limitations on its existence in Indian markets. This study focuses on understanding what cryptocurrency is all about and its impact on the Indian economy. The study also focuses on the present situation and future prospects of cryptocurencies in India. Dr. M. Srinivas et.al (2023) The impact of cryptocurrencies on the Indian economy remains uncertain. While it presents both opportunities and challenges, a cautious and balanced approach is necessary to harness the potential benefits while mitigating the risks. However, in the future, the rigorous empirical studies are to be undertaken to know the real benefits are being enjoyed the people who invested money in cryptocurrency.

Bhavana Sahu et.al (2023) The Indian cryptocurrency economy has been ranked second in global cryptocurrency adoption, just behind Vietnam. The size of the cryptotech market in India is anticipated to reach $241 million by 2030, growing at a CAGR of 14%, with the potential of creating 877,000 jobs by then. About 1.8% of India's adult population has invested in crypto until 2021, a growth of 2.2 × over a year. This study focuses on understanding what cryptocurrency is all about and its overall impact on the Indian economy. The future of cryptocurrency is uncertain. The study also focuses on the existing scenario and future prospects of cryptocurrency in India. Dr. Kirti Shrivas et.al (2022) Block chains are a type of technology that is used by cryptocurrencies. Blockchains are a decentralized technology that manages and records transactions and is distributed across numerous computers. The security of this technology is one of its appeals. Because they were created as peer-to-peer systems, crypto currencies do not have a central authority to mediate transactions. This Paper examines public perceptions of crypto currencies, examines whether they are seen as secure investments, and examines their

potential application in India as well as their benefits and drawbacks. Pranali Lokhande et.al (2023) A forward-looking crypto policy can have a significant impact on improving our overall financial infrastructure, help safeguard national security, deter financial frauds, strengthen our monetary policy, attract international capital, create more job opportunities, and retain our tech talent to accelerate technological development, thereby driving the nation towards becoming a global powerhouse. Despite the Reserve Bank of India (RBI) being wary of cryptocurrencies, Indians are making a beeline to invest in digital coins, touted as the most important asset class of the 21st century.

Gulshan Kumar et.al (2024) government of India has not established any regulating agencies or regulations dealing with the trading and transactions of cryptocurrency, it does restrict the buying and selling of virtual currencies such as Bitcoins, Litecoins, Ethereal, Ripple, Monero, Neo, etc. The usage of cryptocurrency in Indian marketplaces is subject to several limitations. Understanding cryptocurrencies and their impact on the Indian economy is the aim of this study. The report also examines the present situation and prospects for future expansion of the cryptocurrency business in India. Dr. Priyanka Ghosh et.al (2022) research has discussed various advantages of crypto like less transaction cost, and no effect of inflation along with some disadvantages like an unregulated market, high volatility rate, etc. The study also finds out that the crypto market investment in India will touch a new high of US$15.6 Billion. The crypto market size in India has increased by 40% in 2021 as compared to 2016. The developed technology along with lower transaction costs will attract more Indian investors to invest in crypto shortly. Basukinath Jha et.al (2020) The study delves into challenges, such as market volatility, security concerns, and regulatory uncertainties, offering insights into risk management and investor protection. Additionally, it assesses macroeconomic impacts, including effects on monetary policy, inflation, and capital flows, providing a nuanced understanding of how cryptocurrencies influence the Indian economy. By addressing these multifaceted aspects, the study aims to inform policymakers, financial institutions, and investors about the evolving landscape of digital assets, facilitating a comprehensive understanding of the challenges and opportunities presented by cryptocurrencies. Vibha Suhas Bhilawadikar (2021) This study presents research on the awareness and aspirations of millennials towards different investment asset classes with a special focus on cryptocurrencies. Cryptocurrencies are technology-dependent digital money systems that have created a buzz in the financial markets in a very short period. Digital currencies like Bitcoin, Ethereum, Ripple, Bitcoin Cash, etc., are considered a new investment asset category that seems to be associated with high risk and return.

3. METHODOLOGY

The scale for measuring Millennials' perception of the crypto-verse, focusing on **Expected Benefits, Expected Longevity, Ease of Use, Psychographic, Subjective Norms,** and **Risk Appetite** was developed using a systematic approach. First, a comprehensive pool of items was created based on an in-depth review of the literature and qualitative inputs from Millennials who had varying degrees of exposure to cryptocurrencies. The goal was to ensure the items adequately represented the core dimensions of the identified factors. Second, the items underwent expert review by professionals in behavioral finance, blockchain technology, and psychology. The panel evaluated the items for relevance, clarity, and conciseness. Feedback was incorporated to refine the items, ensuring comprehensive coverage while eliminating redundancies. Third, the refined scale was pretested with a small sample of Millennials to evaluate the clarity and contextual relevance of each item. Based on the feedback, minor adjustments were made to improve wording and comprehension. Next, an exploratory factor analysis (EFA) was conducted on a broader sample to confirm the underlying constructs and assess the scale's validity and reliability. Finally, the validated scale was tested with a larger representative sample to establish robustness and applicability. The construction of a scale to measure Millennials' perceptions toward the **cryptoverse**—the collection of cryptocurrencies, blockchain technologies, and related platforms—was developed through a systematic process involving item development, sampling, and statistical validation.

3.1 Scale Development

To construct a reliable scale, it was essential to develop a pool of items that accurately captured various dimensions of Millennials' perceptions of the cryptoverse. The initial step involved generating 56 items that addressed the factors influencing perceptions of the cryptoverse. These items were derived from existing literature on technology adoption, innovation, and consumer perceptions, supplemented by qualitative input from 27 Millennials who

provided insights into their views on cryptocurrency.

3.2 Sample and Stimuli

The scale to measure Millennials' perceptions of the cryptoverse was developed using data from three separate studies. The first study involved 150 participants who were randomly selected from a consumer panel, ensuring a mix of genders and professions. These participants were exposed to various cryptoverse-related stimuli, such as cryptocurrency exchanges, blockchain applications, and digital wallets, through both verbal and visual formats. They evaluated these technologies at their own pace, providing insights into their perceptions and reactions. To understand the structure of the scale, exploratory factor analysis (EFA) was used, a method that works well with non-normal data. Different models were tested, including reflective and formative models, and the formative model proved to be the best fit. Unlike reflective models, where items represent underlying factors, a formative model treats each item as directly contributing to the overall perception. The weight of each item was calculated, with higher weights indicating a stronger influence on the overall perception of the cryptoverse.

The final scale was constructed as an index, where each item's weight determined its impact on the overall score. This approach ensured that all items in the scale mattered and reflected their direct importance in shaping Millennials' perceptions. Items with higher weights were considered more significant, highlighting their role in forming opinions about the cryptoverse. The scale measures key aspects such as trust, innovation, and perceived benefits of cryptocurrency and blockchain technologies. The development process ensures that the scale accurately captures Millennials' evolving perceptions of these technologies. The study's sample included a balanced distribution of male and female participants, making the findings more applicable across genders and ensuring diverse perspectives were represented. In summary, this scale provides a reliable way to understand how Millennials view the cryptoverse, emphasizing the factors that most influence their perceptions.

3.3 Construct validation studies

Scale reliability

In the present study, we assess the reliability of the measurement scales using several key indicators: **Cronbach's alpha** (both standardized and unstandardized), **composite reliability (rho_c),** and **average variance extracted (AVE).** These measures are essential for evaluating the internal consistency and validity of the scales used in the study.

Table 2: ***Reliability and Validity Statistics for Constructs***

	Cronbach's alpha	**Composite reliability (rho_a)**	**Composite reliability (rho_c)**	**Average variance extracted (AVE)**
Expected Benifit	0.937	0.943	0.947	0.668
Expected Ease of Use	0.789	0.925	0.860	0.555
Expected Longevity	0.774	0.897	0.841	0.496
Psychographic Variable	0.973	0.974	0.978	0.880
Risk Appetite	0.722	0.754	0.818	0.481
Subjective Norm	0.795	0.844	0.851	0.494

The reliability and validity statistics for the constructs in this study provide valuable insights into the internal consistency and measurement quality of each scale. The Expected Benefit construct exhibits excellent internal consistency with a very high Cronbach's alpha of 0.937 and a robust composite reliability (rho_c) of 0.947, indicating strong reliability. Similarly, the Psychographic Variable demonstrates outstanding reliability with a Cronbach's alpha of 0.973 and a composite reliability of 0.978, underscoring its robustness. The Expected Ease of Use and Expected Longevity scales show good reliability with Cronbach's alpha values of 0.789 and 0.774, respectively, and composite reliability values of 0.860 and 0.841, suggesting they are reliable but could benefit from minor refinements. The Risk Appetite and Subjective Norm constructs, with Cronbach's alpha values of 0.722 and 0.795, respectively, demonstrate acceptable reliability, though they may require further adjustment for improved internal consistency. In terms of validity, the Psychographic Variable has the highest Average Variance

Extracted (AVE) of 0.880, reflecting its strong explanatory power, while the Expected Benefit construct has a solid AVE of 0.668, indicating it explains a good proportion of variance. The Expected Ease of Use meets the acceptable threshold with an AVE of 0.555, but the Expected Longevity (0.496), Risk Appetite (0.481), and Subjective Norm (0.494) constructs fall slightly below the ideal AVE threshold of 0.5, suggesting that these scales could benefit from refinement to improve their explanatory power and reduce measurement error. Overall, the results indicate that most constructs exhibit strong reliability and validity, with the Psychographic Variable being the most robust. Constructs such as Expected Longevity, Risk Appetite, and Subjective Norm show acceptable reliability but would benefit from further refinement to enhance their measurement precision and validity.

Discriminant Validity:

Discriminant validity was assessed by examining the correlations between the constructs in this study to ensure that each construct is empirically distinct and not overlapping too much with others. Specifically, discriminant validity is supported when constructs that are conceptually different show low correlations with each other, while constructs that measure the same concept show higher correlations.

Table 3: ***Discriminant Validity Between Latent Constructs***

	Expected Benifit	**Expected Ease of Use**	**Expected Longevity**	**Percep Score**	**Psychographic Variable**	**Risk Appetite**	**Subjective Norm**
Expected Benifit	0.817						
Expected Ease of Use	0.829	0.745					
Expected Longevity	0.816	0.796	0.704				
Percep Score	0.891	0.871	0.923	1.000			
Psychographic Variable	0.851	0.852	0.871	0.962	0.938		
Risk Appetite	0.658	0.649	0.744	0.852	0.766	0.693	
Subjective Norm	0.703	0.654	0.753	0.865	0.829	0.713	0.703

In the present study, the correlation values between the constructs indicate that discriminant validity is largely upheld. Expected Benefit exhibits a moderate to strong correlation with Expected Ease of Use (0.829) and Expected Longevity (0.816), suggesting these constructs are related but still distinct, as the correlation values are not excessively high. This implies that while Expected Benefit shares some commonality with these constructs, it remains a separate and unique dimension. Expected Longevity shows a strong correlation with Expected Ease of Use (0.796), indicating shared variance between the two constructs, yet it retains its distinctiveness as evidenced by the lower correlations with Psychographic Variable (0.871) and Risk Appetite (0.744). Similarly, Psychographic Variable demonstrates moderate to strong correlations with Expected Longevity (0.871) and Expected Ease of Use (0.852), but these values are not so extreme as to compromise the uniqueness of the construct, supporting its conceptual separation. Risk Appetite shows moderate correlations with Expected Benefit (0.658), Expected Longevity (0.744), and Psychographic Variable (0.766), suggesting that while it shares some variance with these constructs, it remains a distinct measure. Lastly, Subjective Norm demonstrates moderate to strong correlations with Expected Benefit (0.703), Expected Longevity (0.753), and Psychographic Variable (0.829), reflecting meaningful relationships while maintaining its conceptual distinction. Overall, the observed correlation patterns indicate that the constructs are related but empirically distinct, thereby supporting the discriminant validity of the measurement model. Each construct appears to measure a separate dimension, contributing uniquely to understanding the constructs in the study.

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CORRELATIONS

Table 4: ***Correlations between Latent Constructs***

	Expected Benifit	Expected Ease of Use	Expected Longevity	Percep Score	Psychographic Variable	Risk Appetite	Subjective Norm
Expected Benifit	1.000	0.829	0.816	0.891	0.851	0.658	0.703
Expected Ease of Use	0.829	1.000	0.796	0.871	0.852	0.649	0.654
Expected Longevity	0.816	0.796	1.000	0.923	0.871	0.744	0.753
Percep Score	0.891	0.871	0.923	1.000	0.962	0.852	0.865
Psychographic Variable	0.851	0.852	0.871	0.962	1.000	0.766	0.829
Risk Appetite	0.658	0.649	0.744	0.852	0.766	1.000	0.713
Subjective Norm	0.703	0.654	0.753	0.865	0.829	0.713	1.000

The correlations presented in the table highlight the relationships between various latent constructs relevant to user behavior and decision-making. Expected Benefit shows a strong positive correlation with all other constructs, particularly with the Psychographic Variable (0.851) and Expected Ease of Use (0.829), suggesting that perceived advantages are closely tied to user attitudes and the ease of interacting with a product or service. Similarly, Expected Ease of Use is strongly associated with Expected Benefit (0.829) and Psychographic Variable (0.852), emphasizing the interplay between usability and user attitudes. Expected Longevity also demonstrates high correlations, particularly with the Psychographic Variable (0.871) and Perception Score (0.923), indicating that perceptions of durability are influenced by personal attitudes and social factors. Interestingly, the Psychographic Variable stands out with consistently high correlations across all constructs, with particularly strong ties to Expected Longevity (0.871) and Subjective Norm (0.829). This underscores its central role in shaping expectations and perceptions. Risk Appetite, while showing moderate correlations with most constructs, is less connected to Subjective Norm (0.713), suggesting that social influences might play a smaller role in risk-related decisions compared to personal attitudes or perceptions of product attributes. Finally, Subjective Norm exhibits moderate to strong correlations, particularly with the Psychographic Variable (0.829) and Perception Score (0.865), highlighting the importance of social expectations in influencing user behavior. Overall, the data suggest a complex, interdependent relationship between these constructs, with attitudes, expectations, and social factors playing significant roles in shaping behavior. Each construct is interlinked, demonstrating that perceptions of benefit, ease of use, longevity, and social influences are crucial in understanding user decisions and actions.

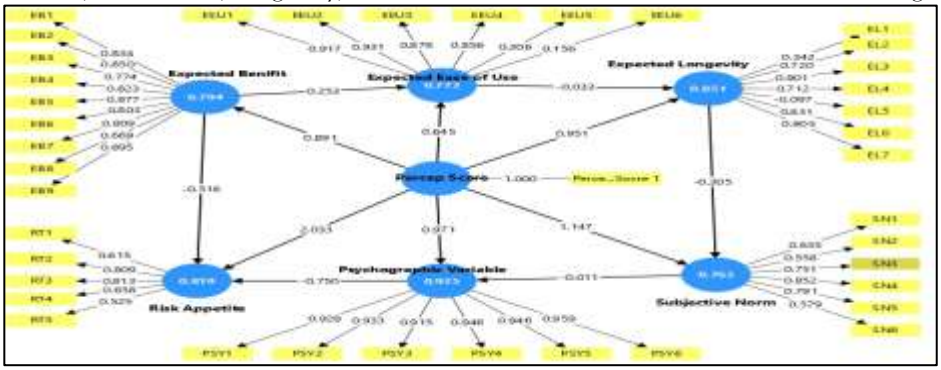

Figure 1: Relationships between Latent Constructs and Their Indicators

The figure illustrates the relationships between multiple survey questions (indicators) and various latent constructs, including Expected Benefit (EB), Expected Ease of Use (EEU), Expected Longevity (EL), Perceptual Score (Percep Score), Psychographic Variable (PSY), Risk Appetite (RA), and Subjective Norm (SN). The model helps in evaluating the extent to which each indicator effectively represents the underlying latent factors, as analyzed through Exploratory Factor Analysis (EFA). Expected Benefit (EB) shows strong connections with its indicators, particularly EB1 to EB9, with path coefficients ranging from 0.774 to 0.895, suggesting these measures are highly reliable in capturing the latent construct. Expected Benefit significantly influences Expected Ease of Use (EEU) with a path coefficient of 0.794, emphasizing the relationship between perceived benefits and ease of interaction with the system. Expected Ease of Use (EEU) also demonstrates a solid correlation with its indicators, especially EEU1 to EEU3 (path coefficients from 0.917 to 0.931), validating its measurement. The Psychographic Variable (PSY) is a central construct with the highest explanatory power of 0.925, with its strongest indicators being PSY1 to PSY6, showing significant loadings between 0.751 and 0.946. It influences Risk Appetite (RA) (path coefficient 0.819) and Expected Longevity (EL) (path coefficient 0.851), highlighting its pivotal role in shaping perceptions and behaviors. Expected Longevity (EL) is well-explained by its indicators, particularly EL3, EL5, and EL7 (path coefficients from 0.712 to 0.905), suggesting that perceptions of durability are shaped by personal attitudes and expectations. Risk Appetite (RA) has a moderate explanatory power with a path coefficient of 0.819, with its indicators ranging from 0.525 to 0.813, indicating some variance in the alignment of this construct with its indicators. Finally, Subjective Norm (SN) has moderate explanatory power (0.763) with its strongest indicators, SN1 to SN6, particularly SN3 (0.852), showing a significant relationship with perceptions and social influences. It is influenced by Expected Ease of Use and Psychographic Variable, underscoring the role of both personal attitudes and social factors in shaping subjective norms. Overall, the model highlights the interconnectedness of these constructs, with Psychographic Variable being a key determinant in shaping behaviors and perceptions. The strong relationships among constructs and their indicators affirm the robustness of the model, suggesting a comprehensive framework for understanding user behavior and decision-making.

4. RESULT AND DISCUSSION

The study aimed to develop and validate a reliable scale for assessing constructs related to user behavior, including Expected Benefit, Expected Ease of Use, Expected Longevity, Psychographic Variable, Risk Appetite, and Subjective Norms. The results from reliability and validity analyses provide insights into the effectiveness of the measurement model. The reliability analysis demonstrated that most constructs were measured effectively. Expected Benefit exhibited excellent internal consistency, with a Cronbach's alpha of 0.937 and composite reliability (rho_c) of 0.947, confirming that the construct was well-represented. Similarly, the Psychographic Variable showed outstanding reliability, with a Cronbach's alpha of 0.973 and rho_c of 0.978, reflecting its robustness. Expected Ease of Use (alpha = 0.789, rho_c = 0.860) and Expected Longevity (alpha = 0.774, rho_c = 0.841) demonstrated good reliability, though refinement may improve precision further. Risk Appetite (alpha = 0.722, rho_c = 0.818) and Subjective Norm (alpha = 0.795, rho_c = 0.851) showed acceptable reliability, albeit with room for improvement.

The Average Variance Extracted (AVE) revealed strong validity for some constructs, with the Psychographic Variable (AVE = 0.880) and Expected Benefit (AVE = 0.668) explaining a substantial proportion of variance. Expected Ease of Use (AVE = 0.555) met the acceptable threshold, while Expected Longevity (AVE = 0.496), Risk Appetite (AVE = 0.481), and Subjective Norm (AVE = 0.494) fell slightly below the ideal threshold of 0.5, indicating that these constructs might benefit from refinement to improve their explanatory power. Factor loadings highlighted the robustness of individual indicators. Expected Benefit displayed strong loadings across items, particularly EB1 to EB4, while EB9 contributed less effectively. Psychographic Variable indicators showed consistently high loadings, demonstrating its strong measurement validity. Expected Longevity and Risk Appetite, however, showed variability in indicator strength, suggesting the need for further refinement of weaker items.

The correlation analysis indicated strong interrelationships among constructs while preserving conceptual distinction. For example, Expected Benefit and Psychographic Variable showed a high correlation (0.851), reflecting their close link while maintaining separateness. Constructs such as Risk Appetite and Subjective Norm demonstrated lower correlations, emphasizing their relative independence. Overall, the study validates a robust

measurement model for several constructs while identifying areas for improvement, particularly for Expected Longevity, Risk Appetite, and Subjective Norm. These findings provide a solid foundation for future research and practical applications in understanding user behavior and decision-making.

GENERAL DISCUSSION

This study aimed to develop and validate a reliable measurement scale to assess perceptions of various constructs, including Expected Benefits, Expected Longevity, Expected Ease of Use, Psychographic Variables, Risk Appetite, and Subjective Norms. The findings confirm that the scale is robust in measuring these constructs, offering insights into both strengths and areas for improvement in the reliability and validity of the measurement model. The results demonstrate that the constructs of Expected Benefits and Psychographic Variables are particularly well-represented and reliable. Expected Benefits showed excellent internal consistency, with Cronbach's alpha of 0.937 and composite reliability (rho_c) of 0.947, while the Psychographic Variable exhibited exceptional reliability with a Cronbach's alpha of 0.973 and composite reliability of 0.978. Both constructs had Average Variance Extracted (AVE) values exceeding the recommended threshold, at 0.668 and 0.880, respectively, indicating strong explanatory power. These findings suggest that these constructs are robust and effectively capture their respective latent dimensions.

However, constructs such as Expected Longevity, Risk Appetite, and Subjective Norms demonstrated moderate reliability, indicating room for refinement. Expected Longevity had a Cronbach's alpha of 0.774, composite reliability of 0.841, and an AVE of 0.496, slightly below the acceptable threshold of 0.5. Risk Appetite and Subjective Norms also showed lower AVE values (0.481 and 0.494, respectively), signaling the need for further refinement of their measurement items to enhance validity. These constructs' lower reliability suggests that additional or revised indicators may be necessary to better capture their underlying dimensions. Factor loadings and path coefficients further validated the model, with Expected Benefits and Psychographic Variables displaying strong linkages with their observed indicators. Conversely, Risk Appetite exhibited weaker alignment with its indicators, suggesting that external influences or construct definitions might need to be revisited. Similarly, correlations between constructs highlighted strong interrelationships, such as those between Expected Benefits and Psychographic Variables ($r = 0.852$). While these relationships affirm the interconnectedness of the constructs, overlaps—particularly between Expected Longevity and Psychographic Variables ($r = 0.871$)—indicate the need for careful differentiation to ensure conceptual clarity. The findings contribute to understanding the measured constructs by providing a valid and reliable scale for future research. While the scale effectively captures robust constructs such as Expected Benefits and Psychographic Variables, it also highlights areas for improvement, particularly for Expected Longevity, Risk Appetite, and Subjective Norms. Researchers and practitioners should focus on refining weaker indicators and further exploring construct relationships to enhance the model's robustness. Overall, this study establishes a foundation for measuring perceptions of these constructs and suggests strategies for improving scale reliability and validity. Future research should prioritize the refinement of weaker constructs, explore additional indicators, and delve deeper into the nuanced relationships between latent dimensions to build a more comprehensive understanding of the constructs and their implications.

5. Limitations

Despite the significant contributions of this study, there are several limitations that should be considered when interpreting the findings. First, the sample used for scale construction and validation was limited to 150 Millennials, which may not fully represent the broader Millennial population. As perceptions of the cryptoverse can vary based on factors such as geographical location, socio-economic status, and cultural background, future studies could expand the sample to include more diverse demographic groups to enhance the generalizability of the results. Additionally, the study primarily focused on quantitative data collection and relied on self-reported measures, which may be subject to response biases. Future research could incorporate qualitative methods, such as in-depth interviews or focus groups, to provide a deeper understanding of the nuanced perceptions Millennials have toward the cryptoverse. Another limitation is the potential for construct overlap. The correlation between constructs such as Expected Longevity and Psychographics suggests some conceptual overlap, which warrants further exploration to clarify the distinctiveness of these constructs. Finally, the cross-sectional nature of the study limits the ability to draw causal conclusions about how perceptions of the cryptoverse evolve over time.

Contributions

This study makes several important contributions to the field of consumer behavior and innovation adoption, specifically in the context of user perceptions and decision-making in the cryptoverse. The primary contribution of this research lies in the development and validation of a reliable scale to measure constructs such as Expected Benefits, Expected Ease of Use, Expected Longevity, Psychographic Variables, Risk Appetite, and Subjective Norms. This scale provides a solid foundation for future research by offering a robust tool for systematically assessing the factors that influence user behavior and engagement with technologies like cryptocurrencies and blockchain. By employing Exploratory Factor Analysis (EFA), the study provides valuable insights into the internal consistency, discriminant validity, and conceptual clarity of these constructs. The findings underscore the importance of constructs like Expected Benefits and Psychographic Variables in shaping user perceptions and decisions, offering practical implications for marketers and developers in the cryptoverse space. These insights can help create more targeted strategies to enhance user engagement and adoption of digital currencies and blockchain technologies. Furthermore, the study identifies key areas for refinement, particularly with constructs such as Expected Longevity, Risk Appetite, and Subjective Norms. The lower reliability of these constructs highlights the need for further refinement in measurement items to improve scale validity and better capture the underlying dimensions. This aspect of the research opens avenues for future studies focused on improving measurement precision and understanding the evolving relationships between these constructs. Overall, this study contributes both theoretically and practically to the field by providing a validated measurement scale for user behavior and perceptions. It offers a foundation for future research exploring user engagement with digital technologies and encourages the refinement of constructs for more robust and comprehensive measurement models.

CONCLUSION

This study successfully developed and validated a comprehensive scale to measure Millennials' perceptions of the cryptoverse, encompassing six key constructs: Expected Benefits, Expected Ease of Use, Expected Longevity, Psychographic Variables, Risk Appetite, and Subjective Norms. The findings indicate that the constructs of Expected Benefits and Psychographic Variables exhibit high reliability and strong explanatory power, affirming their central role in shaping Millennials' attitudes toward cryptocurrencies and related technologies. Conversely, constructs like Expected Longevity, Risk Appetite, and Subjective Norms demonstrated moderate reliability and slightly weaker validity, suggesting the need for further refinement to enhance their measurement accuracy. The study also highlighted the interrelated nature of these constructs, revealing that perceptions are shaped not only by usability and benefits but also by deeper psychographic and social influences. The validated scale offers a robust tool for future research and practical applications, enabling businesses, marketers, and policymakers to better understand and engage with the Millennial demographic in the evolving digital financial ecosystem. However, limitations such as a restricted sample size and reliance on self-reported data suggest avenues for future research using more diverse populations and longitudinal methods. Overall, the study provides a valuable foundation for advancing insights into Millennial engagement with the cryptoverse.

STATEMENTS AND DECLARATIONS

Ethical Approval

"The submitted work is original and not have been published elsewhere in any form or language (partially or in full), unless the new work concerns an expansion of previous work."

Consent to Participate

"Informed consent was obtained from all individual participants included in the study."

Consent to Publish

"The authors affirm that human research participants provided informed consent for publication of the research study to the journal."

Author Contributions

"All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by [Kshemendra Mishra] and [Dr. Jai Singh Parmar]. The first draft of the manuscript was written by [Kshemendra Mishra] and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript."

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Competing Interests

"The authors have no relevant financial or non-financial interests to disclose."

Availability of data and materials

"The authors confirm that the data supporting the findings of this study are available within the article."

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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