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The Influence of Financial Literacy, Risk Perception, Digital Technology Advancement, and Herding Behavior on Investment Decisions: The Mediating Role of Market Discipline

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Abstract

The rapid advancement of digital technology has significantly increased access to investment platforms, particularly among students. However, this convenience does not necessarily translate into well-informed investment decisions. Many novice investors, including Master's (Strata 2) students in Jakarta, often lack sufficient proficiency in financial concepts and the proficiency in assessing potential financial risks, rendering them vulnerable to high-risk and speculative investments. This study aims to examine the influence of financial literacy, risk perception, digital technology advancement, and herding behavior on investment decisions, with market discipline acting as a mediating variable.

Quantitative procedures were implemented using Structural Equation Modeling (SEM) with the Partial Least Squares (PLS) method. The research population comprised Master's students in Jakarta who have access to digital investment platforms. A purposive sampling technique was used to select 210 respondents, with data collected through structured questionnaires.

The results indicate that financial literacy and digital technology advancement positively influence investment decisions, whereas risk perception and herding behavior have a negative impact. Furthermore, market discipline functions as a significant mediating variable, supporting more rational investment behavior.

Despite its contributions, the study is limited to Master's students in Jakarta, which potentially limiting the relevance of the findings beyond the studied sample Future research is encouraged to include a more diverse demographic and to incorporate additional psychological and economic variables. This study provides insights into the academic literature by positioning market discipline as a mediating factor, offering new insights into the behavioral and cognitive dimensions of investment decision-making among young investors.

Keyword: Financial Literacy, Risk Perception, Digital Technology Advancement, Herding Behavior, Market Discipline, Investment Decisions, SEM-PLS

1. Introduction

Technological progress has significantly improved students' ability to engage in investment activities through digital platforms such as stocks, mutual funds, and cryptocurrencies.

However, this accessibility does not always align with wise decision-making. Many novice investors, including Strata 2 (Master's) students in Jakarta, lack adequate financial literacy and a proper understanding of risk, making them vulnerable to high-risk and speculative investments. Masters students, who are entering the professional world, are in a unique position—possessing a high level of education but limited investment experience. Their decisions are often shaped by psychological factors such as the Fear of Missing Out (FOMO) and herding behavior, particularly amid the growing exposure to investment-related information on social media platforms. This phenomenon is further exacerbated by Indonesia's low level of financial literacy, which hinders their ability to assess investment risks effectively. Santoso et al. (2023) explained that FinTech plays an essential role in driving digital transformation in the financial services sector due to its ability to offer more efficient, accessible, and customer-oriented services.

Students' investment decisions are increasingly influenced by advancements in digital technology, which offer convenience but also heighten the risk of impulsive and poorly informed investments. Moreover, the tendency to follow market trends without adequate analysis can result in irrational decision-making. In this context, market discipline functions as a regulatory mechanism that promotes more prudent and responsible investment behavior. The study intends to investigate the connections among financial literacy, risk perception, digital technology advancement, and herding behavior in shaping the investment decisions of Master's (Strata 2) students in Jakarta, with market discipline acting as a mediating variable. By gaining a comprehensive understanding of these interrelated factors, the research aims to address gaps in the existing academic literature and offer practical insights for improving financial literacy and reinforcing market discipline among young investors. In support of this perspective, Halim et al. (2021) emphasized that data-driven insights contribute to understanding the level of investment literacy, the influence of social factors, and the preparedness of Malaysian undergraduate students to participate in investment activities.

The study conducted by Annisa, Soma, and Sitorus (2024) reveals that financial literacy, digital literacy, and social capital each exert a significant and positive direct influence on digital financial inclusion. Furthermore, ease of use plays a critical mediating role in the relationship between these variables and financial inclusion. This indicates that individuals with greater levels of financial and digital literacy, coupled with strong social support, are more inclined to access and effectively utilize digital financial services particularly when such services are perceived as user-friendly. The statistical results confirm all proposed hypotheses, with robust R-square and Q-square values demonstrating the model's strong fit and predictive capability. These findings underscore the pivotal role of education, digital competency, and social networks in promoting financial inclusion, especially among Generation Z in the digital era. In a related context, Sukmadilaga et al. (2019) observed that Internet Financial Reporting (IFR) has emerged as a rapidly evolving method for companies to disseminate financial information more widely and efficiently through online platforms.

The study by Novani et al. (2023) Promotes a well-rounded insight into the strengthening of the creative digital ecosystem through a service science approach and cognitive mapping (SODA), highlighting how digital technology can drive innovation and knowledge-based

decision-making. These findings are relevant in the context of digital technology advancement, which plays a significant role in influencing investment decisions. Meanwhile, Sari et al. (2022) examined information security behavior within healthcare information systems, focusing on the various factors that influence such behavior. This indirectly reflects the importance of risk perception in digital environments—an aspect that also affects investor behavior in making secure investment decisions. Moreover, Gunawan et al. (2022) examined institutional barriers and enablers in the sustainability practices of batik SMEs, highlighting how external factors (such as institutional support) can affect market discipline, a market-driven mechanism that guides business conduct, including within investment settings. Collectively, these studies contribute conceptual foundations for understanding how digital technology, risk perception, and institutional dynamics interact to influence investment decisions, particularly when mediated by the role of market discipline.

Research Questions

Drawing from the aforementioned research background, the problem statement addressed in this study is as follows::

1. Is there an influence of financial literacy on investment decisions in undergraduate students in Jakarta?
2. Is there an influence of risk perception on investment decisions in undergraduate students in Jakarta?
3. Is there an influence of digital technology advances on investment decisions in undergraduate students in Jakarta?
4. Is there an influence of herding behavior on investment decisions in undergraduate students in Jakarta?
5. Is there an influence of financial literacy on market discipline in investment decisions in undergraduate students in Jakarta?
6. Is there an influence of risk perception on market discipline in investment decisions in undergraduate students in Jakarta?
7. Is there an influence of digital technology advances on market discipline in investment decision making in undergraduate students in Jakarta?
8. Is there an influence of herding behavior on market discipline in investment decision making in undergraduate students in Jakarta?
9. Is there an influence of market discipline as a mediating variable in the relationship between financial literacy, risk perception, digital technology advancement, and herding behavior on investment decisions among Master's students in Jakarta?

Research Objectives

In line with the problem statement outlined above, this study aims to identify and analyze:

1. The influence of financial literacy on investment decisions in undergraduate students in Jakarta.
2. The influence of risk perception on investment decisions in undergraduate students in Jakarta.
3. The influence of digital technology advances on investment decisions in undergraduate students in Jakarta.
4. The influence of herding behavior on investment decisions in undergraduate students in Jakarta.

5. The influence of financial literacy on market discipline in investment decisions in undergraduate students in Jakarta.
6. The influence of risk perception on market discipline in investment decisions in undergraduate students in Jakarta.
7. The influence of digital technology advances on market discipline in investment decision making in undergraduate students in Jakarta.
8. The influence of herding behavior on market discipline in investment decision making in undergraduate students in Jakarta.
9. The influence of market discipline as a mediating variable between financial literacy, risk perception, digital technology advances, and herding behavior on investment decisions in undergraduate students in Jakarta.

2. Theoretical Framework and Conceptual Model

2.1 Financial Literacy

A solid foundation in financial literacy is crucial for making sound and informed investment decisions. Lusardi and Mitchell (2023) assert that individuals with a high level of financial literacy are more capable of evaluating investment risks and potential returns than those with limited financial knowledge.

2.2 Risk Perception

Risk perception refers to how individuals evaluate the risks associated with an investment. According to Kahneman and Tversky (2020), an individual's perception of risk may significantly affect the extent of their participation in investment activities.

2.3 Digital Technology Advancement

Digital technology enables investors to access information more quickly and accurately. Digital investment platforms such as Ajaib, Bibit, and Bareksa have become tools that facilitate investment access for students (Rahmawati & Setyawan, 2024).

2.4 Herding Behavior

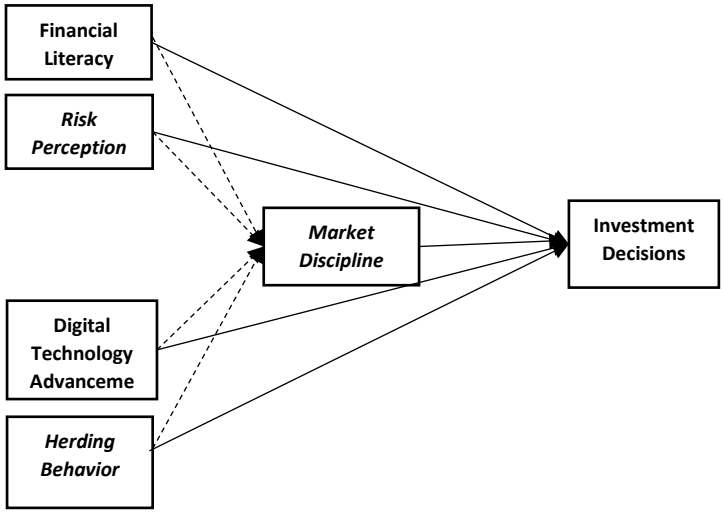
Herding behavior involves investors following the lead of the majority without performing adequate analysis. Hasan et al. (2024) note that this behavior is frequently motivated by the Fear of Missing Out (FOMO), leading individuals to make investment decisions based on social influence rather than objective evaluation.

2.5 Market Discipline

Market discipline serves as a regulatory mechanism that helps mitigate the negative effects of emotional and irrational investment decisions (Flannery, 2023). With market discipline, investors are more likely to make well-informed decisions based on thorough analysis. According to Sugiyono (2019), a hypothesis represents a provisional answer to the stated research problem. Based on the previously explained framework, the hypothesis in this study can be formulated as follows:

H_1: Financial literacy has a positive and significant effect on investment decisions.
H_2: Risk perception has a negative effect on investment decisions.
H_3: Digital technology advancement has a positive effect on investment decisions.
H_4: Herding behavior has a negative effect on investment decisions.
H_5: Financial literacy has a positive effect on market discipline.
H_6: Risk perception has an effect on market discipline.
H_7: Digital technology advancement has a positive effect on market discipline.
H_8: Herding behavior has a negative effect on market discipline.
H_9: Market discipline has a positive effect on investment decisions.

2.6 Conceptual Framework



3. Methodology

This study adopts a quantitative approach by utilizing the Structural Equation Modeling (SEM) technique based on Partial Least Squares (PLS).

3.1 Population and Sample

The population of this study consists of Strata 2 (Master's) students in Jakarta who have access to digital investment platforms. The sample comprises 210 students, selected purposively based on specific criteria.

3.2 Data Collection Technique

Data were collected through questionnaires, which were tested for validity and reliability via a pretest before being used in the study. This research aims to examine the influence of financial literacy, risk perception, digital technology advancement, and herding behavior on investment decisions, with market discipline as a mediating variable. It also integrates findings from previous studies, such as Lusardi & Mitchell (2023) on financial literacy and Hasan et al. (2024) on the impact of herding behavior on investment decisions. By utilizing the SEM-PLS approach, this study provides a deeper understanding of how psychological factors, technology, and investor behavior contribute to students' investment decisions. Thus, this research is expected to serve as a reference for improving financial literacy and market discipline among student investors. The explanation above serves as the foundation for developing the following conceptual framework for this study.

4. Result

4.1 PLS Analysis

a. Evaluation of Measurement Model (Outer Model)

The Outer Model is used to evaluate the relationship between latent constructs and their corresponding indicators (Ghozali, 2018). This evaluation involves three primary assessments:

1. Convergent Validity Test

Convergent validity is tested to ensure that each indicator accurately represents its corresponding latent construct. This is evaluated through the loading factor, with a recommended threshold of greater than 0.70. However, in the early stages of research, loading values between 0.50 and 0.60 may still be considered acceptable (Ghozali, 2021).

2. Discriminant Validity Test

Discriminant validity is assessed to determine whether an indicator measures its intended construct more strongly than it correlates with other constructs. This evaluation is typically according to the Fornell-Larcker Criterion and cross-loading analysis, each construct's square root of the Average Variance Extracted (AVE) should surpass its correlations with other latent variables (Sekaran & Bougie, 2017).

3. Reliability Test

Reliability testing evaluates the measurement of the instruments' internal consistency via examining Composite Reliability and Cronbach's Alpha values. A coefficient value above 0.70 indicates acceptable reliability (Hair et al., 2017). This test ensures that the measurement instruments consistently produce stable results across various conditions.

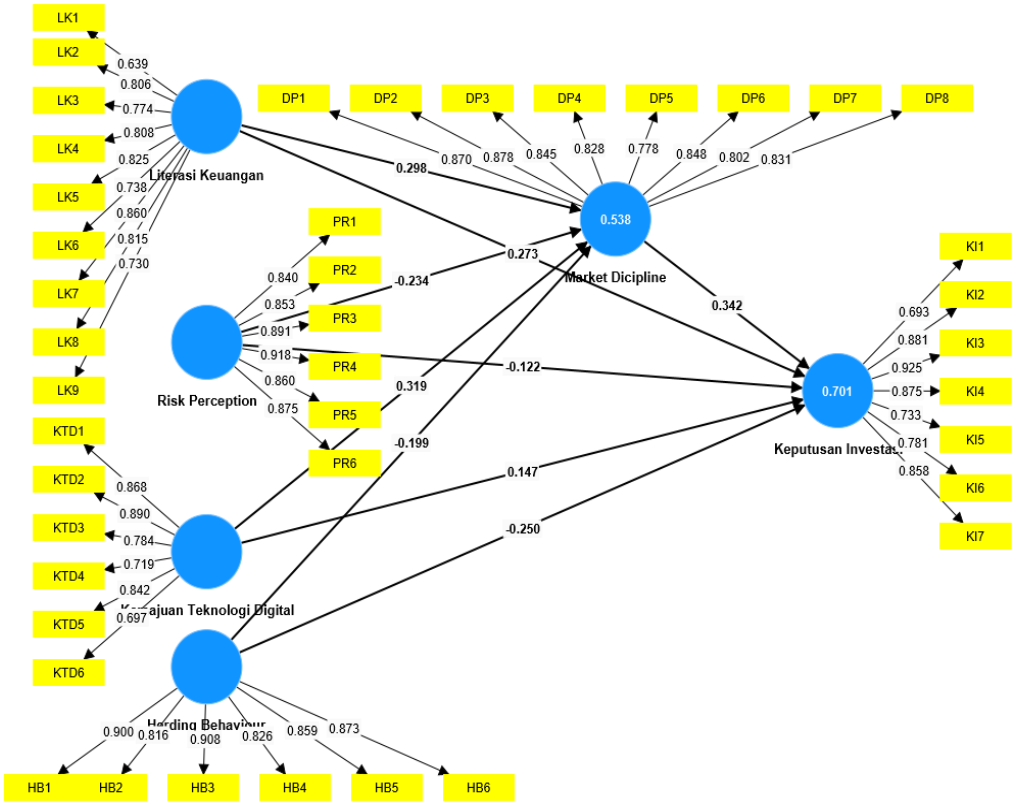


Figure 1. SmartPLS 4.0 Algorithm Results
Source: Output Processing with SmartPLS 4.0

4.2 Convergent Validity

Convergent validity evaluates how well each indicator represents its latent construct. A loading factor above 0.70 is considered valid, despite values between 0.50 and 0.60 being permissible in initial stages of research.

Table 1. Convergent Validity Test Results

Variables	Indicator	Loading Factor	AVE
Financial Literacy	LK1	0.639	0.608
	LK2	0.806	
	LK3	0.774	
	LK4	0.808	
	LK5	0.825	
	LK6	0.738	
	LK7	0.860	
	LK8	0.815	
	LK9	0.730	
Risk Perception	PR1	0.840	0.762
	PR2	0.853	
	PR3	0.891	
	PR4	0.918	
	PR5	0.860	
	PR6	0.875	
Digital Technology Advancement	KTD1	0.868	0.646
	KTD2	0.890	
	KTD3	0.784	
	KTD4	0.719	
	KTD5	0.842	
	KTD6	0.697	
Herding Behavior	HB1	0.900	0.747
	HB2	0.816	
	HB3	0.908	
	HB4	0.826	
	HB5	0.859	
	HB6	0.873	
Investment Decisions	KI1	0.693	0.680
	KI2	0.881	
	KI3	0.925	
	KI4	0.875	
	KI5	0.733	
	KI6	0.781	
	KI7	0.858	
Market Discipline	DP1	0.870	0.698
	DP2	0.878	
	DP3	0.845	
	DP4	0.828	
	DP5	0.778	
	DP6	0.848	
	DP7	0.802	
	DP8	0.831	

Source: Output Processed with SmartPLS 4.0

From the table above, it is evident that all research variable indicators are valid, as their Outer Loadings values exceed 0.7. Therefore, the questionnaire items can be utilized for further analysis.

4.3 Discriminant Validity

To confirm discriminant validity, the square root of the Average Variance Extracted (√AVE) of each construct is compared to its correlations with other constructs. The model demonstrates adequate discriminant validity when the √AVE exceeds these correlations. The results, based on the Fornell-Larcker criterion from the SmartPLS 4.0 output, are shown in Table 2.

Table 2. Results of Discriminant Validity Test (Fornell-Larcker Criteria)

	Herding Behavior	**Digital Technology Advancement**	**Investment Decisions**	**Financial Literacy**	***Market Discipline***	***Risk Perception***
Herding Behavior	0.864					
Digital Technology Advancement	-0.399	0.804				
Investment Decisions	-0.594	0.572	0.825			
Financial Literacy	-0.191	0.380	0.569	0.780		
Market Discipline	-0.502	0.567	0.743	0.499	0.836	
Risk Perception	0.504	-0.234	-0.488	-0.177	-0.462	0.873

Source: Output Processed with SmartPLS 4.0

As indicated in Table 2, the square root of the AVE for each construct is greater than its correlations with other constructs, implying that the model meets the criteria for discriminant validity.

4.4 Reliability

Composite reliability assesses the internal consistency of constructs in the Partial Least Squares (PLS) model by measuring how reliably the indicators represent their latent constructs. A composite reliability (ρc) value above 0.70 indicates strong reliability. The results demonstrate that all constructs display ρc values exceeding 0.70, confirming that the model demonstrates excellent internal consistency.

Table 3. Evaluation Results of AVE, Composite Reliability, and Cronbach's Alpha

	Cronbach 's alpha	*Composite reliability (rho_a)*	*Composite reliability (rho_c)*	*Average variance extracted (AVE)*
Herding Behavior	0.932	0.934	0.947	0.747
Digital Technology Advancement	0.890	0.915	0.916	0.646
Investment Decisions	0.920	0.931	0.936	0.680
Financial Literacy	0.919	0.929	0.933	0.608
Market Discipline	0.938	0.941	0.949	0.698
Risk Perception	0.937	0.938	0.951	0.762

Source: Output Processed with SmartPLS 4.0

As shown in the table, all AVE values exceed the recommended threshold of 0.50, indicating that the indicators possess adequate convergent validity. Additionally, both Cronbach's Alpha and Composite Reliability values for all latent constructs are ≥ 0.70, confirming strong internal consistency. Thus, the research instrument is considered both valid and reliable for use in this study.

4.5 R Square Analysis

Referred to as the structural model, the inner model shows how latent variables relate to one another based on theory. Its assessment involves examining the R-square (R^2) values of the dependent variables, which indicate the proportion of variance explained by the independent (exogenous) variables. This helps evaluate the strength and predictive relevance of the model (Ghozali, 2016).

Table 4. R Square

	R^2	**R^2 adjusted**
Investment Decisions	0.701	0.694
Market Discipline	0.538	0.529

Source: Output Processed with SmartPLS 4.0

The R-square (R^2) value reflects the extent to which the independent variables account for the variance in the dependent variables. For Investment Decisions, an R^2 value of 0.701 suggests that 70.1% of the variance is explained by Financial Literacy, Risk Perception, Digital Technology Advancement, and Herding Behavior, while the remaining 29.9% is attributed to other factors not included in the model. Similarly, the R^2 value for Market Discipline is 0.538, indicating that 53.8% of its variance is explained by the study's independent variables, whereas 46.2% is influenced by external or unexamined factors. These results demonstrate that the model exhibits a moderate level of predictive accuracy, although its explanatory power could be enhanced by incorporating additional variables.

4.6 Hypothesis Testing for Direct Effects

To examine the structural relationships among latent variables, hypothesis testing is performed on the path coefficients by comparing the p-value with the significance level (α = 0.005) or ensuring the t-statistic exceeds 1.96. These p-values and t-statistics are derived from the SmartPLS output through the bootstrapping procedure.

Table 5. Hypothesis Testing for Direct Effects

	Original sample	**Sample mean**	**Standard deviation**	**T statistics**	**P values**
Financial Literacy Investment Decisions→	0.273	0.276	0.050	5,501	0.000
Financial Literacy Market Discipline→	0.298	0.299	0.060	4.935	0.000
***Risk Perception* Investment Decisions→**	-0.122	-0.126	0.061	1,992	0.046
***Risk Perception* Market Discipline→**	-0.234	-0.238	0.063	3.713	0.000
Digital Technology Advances Investment Decisions→	0.147	0.147	0.074	1.976	0.048
Digital Market Discipline Technology Progress→	0.319	0.315	0.070	4,580	0.000
***Herding behavior* Investment Decisions→**	-0.250	-0.251	0.060	4.134	0.000
***Herding behavior* Market Discipline→**	-0.199	-0.199	0.061	3.278	0.001
***Market Discipline* Investment Decisions→**	0.342	0.338	0.077	4.473	0.000

Source: Output Processed with SmartPLS 4.0

Analysis of Intervariable Relationships

1. Financial Literacy has a positive and significant influence on both Investment Decisions and Market Discipline. Those with higher levels of financial literacy tend to make wiser investment choices and show greater financial discipline.
2. Risk Perception has a negative and significant impact on Investment Decisions and Market Discipline. A heightened perception of risk tends to discourage confident and disciplined investment behavior.
3. Digital Technology Advancement positively and significantly affects both Investment Decisions and Market Discipline. The availability and use of advanced digital tools contribute to more informed decision-making and greater market discipline.

4. Herding Behavior shows a negative and significant influence on Investment Decisions and Market Discipline. A tendency to follow market trends without critical analysis leads to poorer investment choices and weaker financial discipline.
5. Market Discipline itself has a positive and significant effect on Investment Decisions, indicating that disciplined investors are more likely to make rational and strategic investment choices.
6. These findings underscore the important roles of financial literacy, digital technology advancement, and market discipline in improving investment decision quality, while risk perception and herding behavior can hinder rational investment behavior.

Hypothesis Testing for Indirect Effects

Table 6. Hypothesis Testing for Indirect Effects

	Original sample	**Sample mean**	**Standard deviation**	**T statistics**	**P values**
Financial Literacy Market Discipline Investment Decisions	0.102	0.101	0.032	3.164	0.002
***Risk Perception*→Market Discipline Investment Decisions**	-0.080	-0.080	0.026	3,098	0.002
Digital Technology Advances Market Discipline Investment Decisions→	0.109	0.106	0.034	3.172	0.002
***Herding Behavior Market Discipline*→Investment Decisions**	-0.068	-0.067	0.026	2,580	0.010

Source: Output Processed with SmartPLS 4.0

Indirect Effects through Market Discipline

The PLS analysis results indicate that Market Discipline acts as a mediator in the relationship between independent variables and Investment Decisions:

1. Financial Literacy → Market Discipline → Investment Decisions (coefficient: 0.102, p-value: 0.002)
2. Higher financial literacy enhances market discipline, leading to more rational investment decisions.
3. Risk Perception → Market Discipline → Investment Decisions (coefficient: -0.080, p-value: 0.002)
4. Higher risk perception reduces market discipline, hindering optimal investment decision-making.
5. Digital Technology Advancement → Market Discipline → Investment Decisions (coefficient: 0.109, p-value: 0.002)
6. Advancements in digital technology enhance market discipline by enabling investors to make more structured and data-informed investment decisions.
7. Herding Behavior → Market Discipline → Investment Decisions (coefficient: -

0.068, p-value: 0.010)

8. Investors who follow market trends without analysis tend to have lower market discipline, negatively affecting investment decisions.
   These results confirm that Market Discipline plays an important role in strengthening the positive impact of financial literacy and digital technology, as well as reducing the negative effects of risk perception and herding behavior on investment decisions.

5. Conclusion and future research direction

This paper draws focus to the value of financial literacy and digital technology utilization in supporting rational investment decision-making. Additionally, market discipline serves as a key factor in mitigating the negative effects of risk perception and herding behavior. The study's implications are expected to assist educational institutions and financial regulators in designing more effective financial education programs for students.

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