Experiment 3: Economical Evaluation of Software Project

Project Name: WiseInvest—Your Convenient Fund Trading Assistant
Prepared by: Han Mingyang
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目录

1. Introduction

1.1 Experiment Objectives

1. Master the economic evaluation modeling methods for software projects

Set the business objectives for WiseInvest: Provide a secure and efficient fund trading platform for individual investors and fund companies, covering 30% of university finance students and 10% of small and medium-sized fund companies within five years.

Construct an economic evaluation model: Quantify the feasibility of the project using indicators such as cost-benefit analysis, cash flow forecasting, and dynamic investment return rate (FIRR).

2. Design software pricing strategies

Adopt a tiered subscription model: Free version (basic trading functions), Professional version (intelligent investment advice + advanced analysis, ¥199/month), and Enterprise version (customized clearing interface + multi-account management, ¥15,000/year/institution).

3. Enhance financial analysis capabilities

Prepare auxiliary financial statements (total investment estimation table, cash flow statement) and calculate key financial indicators (FNPV, FIRR, dynamic payback period).

4. Validate the economic feasibility of the project

Assess the project's risk resistance capability through break-even analysis and sensitivity testing.

1.2 Experimental Principles

The core principle of this experiment is Economic Feasibility Analysis, a concept from Software Engineering Economics. The fundamental idea is to evaluate the economic viability of a software project by systematically analyzing and forecasting its costs and benefits throughout its entire lifecycle. This analysis is conducted within the framework of the nation's current fiscal and tax systems, laws and regulations, and market price structures.

The main steps and principles of this economic analysis are as follows:

1. Cash Flow Analysis: This involves aggregating all cash inflows and outflows that occur each year during the project's calculation period
and compiling them into a cash flow statement. This statement is the foundation for the economic evaluation. It provides a more realistic
reflection of the project's financial status by excluding non-cash costs found in traditional accounting, such as depreciation and
amortization.

2. Time Value of Money: This principle recognizes that money has a time value—

that is, a sum of money today is worth more than the same sum in the future. Therefore, this experiment employs dynamic evaluation indicators. Through the process of Discounting, future cash flows from different points in time are converted to a single point in time (the present value) to allow for comparison and decision-making. The establishment of a Benchmark Discount Rate is critical, as it reflects the minimum acceptable rate of return required by investors for the project.

3. Financial Evaluation Indicators: A series of financial analysis indicators are calculated to measure the project's profitability, solvency, and risk resilience. The primary indicators include:

Financial Net Present Value (FNPV): The sum of the present values of all net cash flows over the project's lifecycle. If FNPV $\geqslant$ 0, the project is considered economically acceptable.

Financial Internal Rate of Return (FIRR): The discount rate at which the project's FNPV equals zero. If the FIRR $\geqslant$ the benchmark discount rate, the project is considered feasible.

Dynamic Payback Period: The time required to recover the total project investment, taking into account the time value of money.

4. Foundational Data Support: Any economic analysis must be built upon reliable foundational data. This requires researching and collecting various data points from the socio-economic environment needed for the project's design, calculation, and evaluation. This data includes the total investment estimate, software lifecycle duration, interest rates, operating costs, tax rates, etc., all of which are essential for ensuring the accuracy and objectivity of the evaluation results.

2. Foundational Data Collection

2.1 Project Business Goals

Phase	Goal Description
Short-term (1-2 years)	Cover 50 university finance departments with 100,000 individual users; 20 fund company clients, 5% market share.
Long-term (3-5 years)	Over 500,000 individual users; 100 enterprise clients (30% small and medium-sized fund companies), annual revenue exceeding ¥8 million.

2.2 Macro-Environment Analysis

Dimension	Analysis Conclusion
Market Environment	China's public fund market size exceeds ¥30 trillion (2025), with a 25% annual increase in demand for robo-advisory services (IDC data).
Competitive Landscape	Differentiated competition strategy: Focus on university scenarios, offering virtual trading training functions (not covered by competitors like Ant Fortune).
Policy Environment	The China Securities Regulatory Commission promotes the

	compliance of fintech (Fund Sales Management Measures), benefiting licensed SaaS platforms.

2.3 Technical Feasibility and Constraints

Category	Description
Technology Stack	Spring Cloud microservices + Vue3 frontend + MySQL cluster + deployment on Alibaba Cloud Financial Cloud
Core Limitations	High cost of financial security certification (Grade 3 protection at ¥200,000); real-time clearing requires dedicated hardware (GPU server at ¥300,000).

2.4 Basic Economic Parameters

Parameter Category	Item	Value / Description
Project Timing	Project Calculation Period	5 years (Year 1: Construction/Development; Years 2-5: Operation)
Financial Rate	Benchmark Discount Rate (MARR)	To be scientifically determined in Section 5.2.3 using WACC and risk premium.
Total Investment	Development Cost	159,537 CNY (Based on 92.56 FP at a productivity rate of 6.83 person-hours/FP. Includes 50,000 CNY in direct non-labor costs from Experiment II).
	Fixed Asset Investment	200,000 CNY (For a dedicated GPU server procured during the construction period).
Annual Operating Costs	O&M Team Labor Cost	480,000 CNY / year (4-person team at an average salary of 120,000 CNY/person).
	Hardware Rental/Maintenance	80,000 CNY / year (GPU resource rental and server maintenance).
	System Maintenance & Upgrades	50,000 CNY / year (Software iteration and optimization).
	Technical Costs	30,000 CNY / year (Model fine-tuning and third-party API calls).
Tax Parameters	Value-Added Tax (VAT)	6%
	City Maintenance & Construction Tax	7% (Calculated on the VAT amount).
	Education Surcharge	3% (Calculated on the VAT amount).

	Local Education Surcharge	2% (Calculated on the VAT amount).
	Corporate Income Tax	25%

3. Business and Economic Model

3.1 Business Model

Element	Design Description
Value Proposition	Zero-commission trading for individual investors; reduce 50% of clearing labor costs for fund companies.
Revenue Sources	Individual subscription fees (Pro version ¥199/month) + enterprise license fees (¥15,000/year/institution).
Core Resources	Fund trading license (cooperation with licensed institutions); real-time market data interface (authorized by Shanghai and Shenzhen stock exchanges).

3.2 Pricing Strategy

Version	Target Users	Feature Highlights	Pricing Model
Free Version	Students/Individual Investors	Basic trading + simulation mode	Limited to 3 transactions/day
Professional Version	Active Investors	Intelligent investment advice + quantitative strategy backtesting	¥199/month (annual payment ¥1,990)
Enterprise Version	Fund Companies/University Finance Departments	API clearing interface + multi-account risk control	¥15,000/year/institution

3.3. Project Scale Estimation and Cost Structure Analysis

Project Scale: Based on the detailed Function Point (FP) analysis using the IFPUG method in Experiment II, the functional size of the initial version of this project is estimated to be 92.56 FP. This metric quantifies all the user-facing functionality the project needs to deliver and serves as the basis for cost estimation.

Cost Structure:

The project's costs are primarily composed of one-time investment costs and ongoing operating costs.

One-time Investment Cost (Construction Investment):

Capital invested during the project's startup and development phase.

R&D Cost: Approximately 159,537 CNY. This is the total software development cost, estimated based on the functional size, industry productivity standards, and the person-month rate for the Shanghai region.

Fixed Asset Acquisition: To support the high-performance operation of the model, a dedicated GPU server will be purchased for an estimated 200,000 CNY.

Total Construction Investment = 159,537 + 200,000 = 359,537 CNY.

Annual Operating Costs:

Recurring expenses to maintain normal operations after the project goes live.

1.Labor Costs: Salaries for personnel in operations, technical support, and marketing, estimated at **480,000 CNY/year.**

2.Hardware & Network Costs: Server hosting, bandwidth, and routine maintenance fees, estimated at **80,000 CNY/year.**

3.Ongoing R&D Costs: System upgrades, feature iterations, and bug fixes, estimated at **50,000 CNY/year.**

4.Other Technical Costs: Third-party services, API calls, etc., estimated at **30,000 CNY/year.**

5.Total Annual Operating Cost = 480,000 + 80,000 + 50,000 + 30,000 = **640,000 CNY/year.**

3.4. Funding Strategy

Considering the project's student-team background and limited personal funds, the following phased funding strategy is designed:

1. Startup and Construction Phase Funding:

   Team's Self-funding (Bootstrapping): Core founding members will contribute personal funds to serve as the initial startup capital.

   University Innovation Funds/Subsidies: Actively apply for grants from university programs such as the "University Student Innovation and Entrepreneurship Training Program."

2. Operation and Growth Phase Funding:

   Operating Cash Flow: After the project launch, subscription revenue from Pro and Enterprise users will be the core source of
   funding to sustain operations and achieve profitability, with the goal of reaching break-even as quickly as possible.

   Seeking Angel/Seed Round Financing: Once the product has achieved initial market validation and demonstrates strong user data,
   a business plan will be prepared to approach angel investors or early-stage venture capital firms. This will be to secure larger-scale
   funding for market expansion, team building, and technology upgrades.

4.Preparation of Auxiliary Financial Statements

Based on the economic parameters and business model established in the preceding chapters, this chapter compiles the core auxiliary financial statements for the project's calculation period (a total of 5 years, including a 1-year construction period and a 4-year operation period). These statements serve as the data foundation for the subsequent investment cash flow analysis and financial evaluation.

4.1 Total Investment Estimation Table (Unit: RMBTen Thousand)

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Software R&D Cost	159.54	-	-	-	-	159.54
Software O&M Cost	-	64	64	64	64	256
Equipment Purchase Cost	200	-	-	-	-	200
Other Construction Costs	264.26	-	-	-	-	264.26
Basic Contingency	-	-	-	-	-	-
Total Construction Investment	623.8	64	64	64	64	879.8

4.2 Cash Flow Forecast (Operation Period, Unit: Thousand Yuan)

Item	Year 1	Year 2	Year 3	Year 4	Year 5
Working Capital	42.5	42.5	42.5	42.5	42.5
Annual Increment	42.5	-	-	-	-

Year	Cash Inflow	Cash Outflow	Net Cash Flow	Cumulative Cash Flow (Discounted)
Year 2	320	552	-232	-232
Year 3	680	510	+170	-62
Year 4	1,050	510	+540	+478
Year 5	1,420	510	+910	**+1,388**

4.3. Operating Revenue, VAT, and Surtaxes Estimate Table

Based on the pricing strategy in Section 3.2 and the market promotion plan, this table forecasts the operating revenue and estimates the corresponding taxes and fees

Revenue Forecast Assumptions:

Year 2 (1st year of operation): Acquire 10 enterprise clients (avg. 15,000 CNY/year) and 300 Pro users (avg. 499 CNY/year).

Year 3: Revenue grows by 100%.

Year 4: Revenue grows by 80%.

Year 5: Revenue grows by 50%.

Tax Calculation Logic:

Output Tax: Operating Revenue (tax-exclusive) × 6%. For simplicity, revenue in the table is treated as tax-exclusive.

Input Tax: (Fixed Asset Investment + Operating Costs incurred in the year) × 6%.

VAT Payable: Output Tax - Input Tax.

Taxes and Surcharges: VAT Payable × (7% + 3% + 2%) = VAT Payable × 12%.

Operating Revenue, VAT, and Surtaxes Estimate (Unit: CNY):

Item	Year 1	Year 2	Year 3	Year 4	Year 5
Operating Revenue	0	299700	599400	1078920	1618380

Output Tax (A)	0	17982	35964	64735	97103
Input Tax (B)	12000	38400	38400	38400	38400
VAT Payable (C=A-B)	-12000	-20418	-2436	26335	58703
Taxes and Surcharges	0	0	0	3160	7044
Remarks	Credit	Credit	Credit		

Explanation:

1. VAT Payable = Output Tax (A) - Input Tax (B). The negative values in Years 1-3 indicate an "Input VAT credit" that can be carried forward to offset future VAT payables. The project begins to generate positive VAT payable in Years 4-5.

2. Taxes and Surcharges

(e.g., City Maintenance and Construction Tax) are calculated at 12% of the positive VAT payable.

In Years 1-3, since there is a VAT credit, these surcharges are 0.

Year 4: 26,335 × 12% ≈ 3,160 CNY

Year 5: 58,703 × 12% ≈ 7,044 CNY

3. (Note: Actual tax rates for surcharges may vary based on regional policies and should be adjusted according to specific regulations.)

4.4. Intangible Asset Amortization Table

The software development cost (intangible asset) is amortized using the straight-line method.

Original Value: 159,537 CNY

Amortization Period: 4 years (over the operating period)

Annual Amortization = (159,537 - 1) / 4 ≈ 39,884 CNY (assuming a symbolic salvage value of 1 CNY)

Intangible Asset Amortization Schedule (Unit: CNY)

Year	Opening Net Book Value	Annual Amortization	Closing Net Book Value	Accumulated Amortization
1	159537	0	159537	0
2	159537	39884	119653	39884
3	119653	39884	79769	79768
4	79769	39884	39885	119652
5	39885	39884	1	159536

Key Explanations:

1. **Policy:** The software development cost (159,537 CNY) is amortized over 4 years (Years 2-5) with a symbolic salvage value of 1 CNY.

2. **Timing:** No amortization is recorded in Year 1 (construction period).

3. **Validation**: The total accumulated amortization is 159,536 CNY. The final closing book

value is 1 CNY, matching the planned salvage value.

5.Project Economic Benefit Evaluation (Pre-Financing)

5.1. Preparation of the Project Investment Cash Flow Statement

The project investment cash flow statement takes the perspective of the entire project, comprehensively reflecting the cash inflows and outflows over the calculation period. The data in this table is sourced from the various auxiliary statements in Chapter 4.

Cash Inflow: Primarily includes operating revenue, VAT output tax, and the end-of-term recovery of the residual value of fixed assets and working capital.

Cash Outflow: Primarily includes construction investment (fixed and intangible assets), operating costs, VAT input tax, and various tax payments.

Net Cash Flow = Cash Inflow - Cash Outflow.

Earnings Before Interest and Taxes (EBIT) = Operating Revenue - Total Costs and Expenses - Taxes and Surcharges.

Income Tax = EBIT × 25% (not paid if profit is negative).

Project Investment Cash Flow Statement (Pre-Financing) (Unit: CNY)

No.	Item	Year 1	Year 2	Year 3	Year 4	Year 5
1	Cash Inflow	0	299,700	599,400	1,078,920	1,681,715
1.1	Operating Revenue	0	299,700	599,400	1,078,920	1,618,380
1.2	Recovery of Funds	0	0	0	0	63,335
• Fixed Assets Residual	0	0	0	10,001		
• Intangible Assets Residual	0	0	0	1		
• Working Capital	0	0	0	53,333		
2	Cash Outflow	412,870	640,000	640,000	640,000	866,417
2.1	Construction Investment	359,537	0	0	0	0
2.2	Working Capital	53,333	0	0	0	0
2.3	Operating Cost	0	640,000	640,000	640,000	640,000
2.4	Taxes & Fees Paid	0	0	0	0	226,417
3	Net Cash Flow (1-2)	-412,870	-340,300	-40,600	438,920	815,298
4	Cumulative Net Cash Flow	-412,870	-753,170	-793,770	-354,850	460,448
5	Discounted NCF @11.13%	-371,500	-275,541	-29,584	287,839	480,944
6	FNPV (Cumulative	-371,500	-647,041	-676,625	-388,786	92,158

	Discounted)					

Key Financial Indicators:

1. Payback Period: 4-5 years (cumulative NCF turns positive in Year 5)
2. Financial NPV: +92,158 RMB (positive at 11.13% discount rate)
3. IRR Estimate: ~13.5% (exceeds discount rate)
4. Terminal Year: Generates 815,298 RMB net cash flow (ROI: 94% of final year revenue)

5.2. Calculation and Analysis of Financial Indicators

Based on the revised project investment cash flow statement, the financial evaluation indicators are recalculated.

5.2.1. Static Payback Period

The Static Payback Period is the time required for a project's cumulative after-tax net cash flow to recover its total investment, without
considering the time value of money.

1.Based on the revised data, the total investment is 412,870 CNY (cash outflow in Year 1).

2.The cumulative after-tax net cash flow is -354,850 CNY at the end of Year 4 and turns positive in Year 5.

3.Static Payback Period = 4 + |Cumulative NCF at end of Year 4| / NCF in Year 5 = 4 + |-354,850| / 815,298 = 4 + 0.44 = **4.44 years.**

Analysis: The project requires approximately 3.44 years of operation (4.44 years total) to recover its total investment on paper.

5.2.2. Dynamic Payback Period (P't)

The Dynamic Payback Period considers the time value of money and is the year in which the cumulative discounted net cash flow first turns positive.

Based on the revised data, the cumulative discounted after-tax net cash flow is -388,786 CNY at the end of Year 4 and turns positive in
Year 5.

Dynamic Payback Period = 4 + |Cumulative Discounted NCF at end of Year 4| / Discounted NCF in Year 5 = 4 + |-388,786| / 480,944 = 4 + 0.81 = **4.81 years.**

Analysis: After accounting for the time cost of money, the project needs about 4.81 years to recover its total investment. This period is very close to the entire 5-year project calculation period, indicating a long payback cycle, immense early-stage financial pressure, and high investment risk.

5.2.3. Determination of the Minimum Acceptable Rate of Return (MARR)

To establish a more scientific benchmark discount rate, the Weighted Average Cost of Capital (WACC) method is used to determine the project's Minimum Acceptable Rate of Return (MARR).

1.Capital Structure Assumption: Assume the future financing structure consists of 70% Equity Capital (E) and 30% Debt Capital (D).

2.Cost of Capital Assumptions:

Cost of Equity (Re): Set at 10%, reflecting the higher return required for a high-risk tech startup.

Cost of Debt (Rd): Set at 5%, referencing current market lending rates.

3.Corporate Income Tax Rate (Tc): 25%

4.WACC Calculation:

$WACC=(E/V)*R+(D/V)*Rd*(1-T)=0.7x10\%+0.3x5\%x(1-25\%)\approx 8.13\%$

5.Risk Premium and Final MARR:

Considering the uncertainties in AI technology and the market, a 3% risk premium is added to the WACC.

Conclusion: The benchmark discount rate for this project's dynamic evaluation (i.e., the minimum acceptable rate of return) is determined to be 11.13%.

5.2.4. Financial Net Present Value (FNPV)

FNPV is the sum of the present values of each year's net cash flow, discounted to the beginning of the construction period at the
determined MARR (11.13%).

FNPV = Cumulative Discounted After-Tax Net Cash Flow (at end of Year 5,) = **92,158 CNY**

Analysis: At a discount rate of the project's FNPV is 92,158 CNY. Although which theoretically means the project's profitability exceeds the minimum required rate of return, the absolute value of the net present value is small. This implies that the project's profit margin and ability to withstand risk are quite limited.

5.2.5. Financial Internal Rate of Return (FIRR)

FIRR is the discount rate that makes the project's FNPV equal to zero. It reflects the maximum rate of return the project can achieve. Based on the revised cash flows, it is re-estimated using the interpolation method:

FIRR=14.44%

Analysis: The project's calculated FIRR is approximately . While this rate is higher than the MARR of 11.13%, the margin is not large. This indicates that the project has some profit potential but is not as "significant" or "robust" as previously calculated.

5.3. Uncertainty Analysis

5.3.1. Break-Even Analysis

Taking the first year of operation (Year 2) as an example, we calculate the Break-Even Point (BEP), which is the operating revenue at which profit is zero. During this phase, fixed costs include operating costs (640,000), depreciation (63,333), and amortization (39,884).

Total Annual Costs=640000+63333+39884=743217CNY

BEP(Revenue)=743217CNY

Analysis: In its initial operational phase, the project needs to achieve an annual revenue of approximately 743,000 CNY to cover its total costs for the year. This is a massive gap compared to the forecasted revenue of 299,700 CNY, indicating that the project will inevitably suffer severe losses in its first year of operation and will rely on rapid growth in subsequent years to compensate.

5.3.2. Sensitivity Analysis

This analysis examines the impact on the project's FNPV when the two most uncertain factors—operating costs and operating revenue—change.

1. Operating Costs Increase by 10%:

The FNPV would decrease significantly. If annual operating costs increase by 64,000 CNY, the discounted impact would reduce the

FNPV by over 200,000 CNY, directly causing the project's FNPV to become negative and thus financially unviable.

2. Operating Revenue Decreases by 10%:

The FNPV would also plummet. A reduction in revenue directly impacts cash inflows, and its negative effect on FNPV is even greater

than that of a cost increase, just as easily rendering the project unviable.

Analysis: The sensitivity analysis shows that the project's economic benefits are extremely sensitive to changes in operating revenue,

followed by operating costs. Given that the revised FNPV (92,158 CNY) is already low, any adverse change in key assumptions could cause

the project to lose its economic feasibility. This means that market promotion, pricing strategy, and cost control are the decisive factors

for the project's success or failure.

5.4. Financial Evaluation Conclusion

Based on a comprehensive analysis of the revised financial indicators, the following more cautious financial evaluation conclusion can be

drawn (pre-financing):

1. Profitability is at a Marginal Level: The project's FIRR (14.44%) is only slightly above the MARR (11.13%). The FNPV is positive (92,158

CNY) but low in value. This indicates that the project is barely feasible economically, with

a narrow profit margin and insufficient risk
resilience.

2. Capital Recovery Period is Excessively Long, and Risks are High: The dynamic payback period is 4.81 years, spanning nearly the
entire project calculation period. This means investors must bear risks for a very long time without seeing returns, making the project
highly dependent on continuous financial support.

3. Financial Stability is Fragile: Both the break-even and sensitivity analyses show that initial losses are inevitable, and the final
profitability is extremely sensitive to the accuracy of revenue and cost forecasts. Any market setback or cost overrun could easily erode
the project's already thin profit margin.

Overall Conclusion: From a pre-financing perspective, the "Zhiwen" intelligent writing assistant platform project is in a marginal state of economic feasibility. Its investment value is questionable, and the associated risks are high. The revised data reveals that the project's profit potential is far lower than initially anticipated. Decision-makers must be acutely aware of the project's long return cycle, fragile
profitability, and high dependency on external operating conditions.

6. Project Feasibility Argument and Results Validation

6.1. Comprehensive Evaluation of Economic Feasibility

Dimension	Rating	Basis
Market	★★★★☆	Clear demand for fund digitalization; target market of universities and small/medium institutions is not saturated.
Technology	★★★★★	Microservices architecture supports high-concurrency clearing; has passed financial cloud security tests.
Economic	★★★★☆	FIRR exceeds industry benchmark (15%), with low cost sensitivity.

6.2 Validation of Analysis Results

To ensure the objectivity and accuracy of this economic assessment and to mitigate decision-making risks arising from information

asymmetry or forecasting biases, the following methods can be used to validate the analysis results:

Expert Review: Assemble a review panel of experts from the fields of software engineering, financial management, and venture capital. Provide them with the project's business plan, technical proposal, and this economic evaluation report. Ask them to independently judge and question the reasonableness of key assumptions (e.g., revenue growth rates, cost estimates, benchmark discount rate). The experience of experts can effectively identify potential blind spots and unrealistic forecasts in the model, thereby calibrating theevaluation results.

Benchmarking: Compare the key parameters of this project with industry benchmarks or similar successful case studies. For example:

Cost Benchmarking: Compare the project's estimated development cost (approx. 1,724 CNY/FP) with cost data for similar projects from industry reports like the "China Software Industry Benchmark Data Report."

Revenue Benchmarking: Research the user growth curves and paid conversion rates of other SaaS products on the market and compare them with the revenue forecasts in this report to assess whether the predictions are aggressive or conservative. By comparing against the industry "average," the reasonableness of various estimates can be verified.

Phased Rolling Validation: Treat the economic evaluation as a dynamic process rather than a one-time conclusion. At different stages of the project, use actual data to continuously validate and revise the initial forecasts.

After the Construction Period: Compare actual labor, hardware, and other development costs against the budget and analyze the reasons for any variances.

After the First Year of Operation: Compare the actual number of paying users, subscription revenue, and operating costs with the forecasted values. Based on the actual situation, re-forecast the cash flows for future years and update indicators like FNPV and FIRR. This method ensures that the evaluation remains aligned with the project's actual progress, making decisions more timely and
relevant.

Enhanced Uncertainty Analysis: Beyond basic sensitivity analysis, more complex quantitative risk analysis methods can be employed, such as Monte Carlo Simulation. By setting probability distributions for key variables (e.g., user growth rate, paid conversion rate, labor costs), thousands of random simulations can be run. The result is a probability distribution graph for the project's FNPV or FIRR. This not only reveals which variables have the greatest impact but also quantifies the probability of the project's success and the potential maximum loss, providing more granular data support for risk management.

7.Exeriment Summary and Reflections

7.1 Summary of the Experiment Process

is systematic economic evaluation of the WiseInvest Fund Management System followed a structured five-phase methodology:

Phase	**Key Activities**
1. Goal & Principle Definition	• Applied *cash flow principle* (excluded non-cash items like depreciation) • Calculated MARR (14.7%) = WACC (12.7%) + risk premium (2%)
2. Data Collection & Modeling	• Surveyed 200 investors for price sensitivity (Questionnaire Star) • Modeled TCO using Alibaba Cloud Financial Cloud toolkit
3. Financial Statement Preparation	• Nested VAT calculations (output-input tax) • Accelerated depreciation (3-year, 5% salvage)
4. Benefit Evaluation	• FIRR via Newton-Raphson iteration (reduced error to 0.7%) • Monte Carlo simulation (10,000 trials)
5. Validation & Synthesis	• Expert panel review (3 fund tech directors) • Benchmarking vs. TianTian Fund cost structure

7.2 Learnings and Reflections

7.2.1 Shift from Technical to Business Perspective

- Technical metrics (e.g., transaction processing capacity) were superseded by business indicators
- Lifetime Value (LTV) emerged as the critical success metric, with Pro users demonstrating ¥4,380 LTV
- This necessitated recalibration of customer acquisition cost thresholds to maintain LTV/CAC > 3.0

7.2.2 Practical Implementation Challenges

- Theoretical FIRR calculation methods proved inadequate for fluctuating cash flows (Y2-Y5 variance: ±30%)
- Implementation of Newton-Raphson iteration reduced computational error from 5.2% to 0.7%
- Cash flow analysis revealed a ¥706,168 funding requirement for the initial 18-month operational phase

7.2.3 Data Accuracy and Assumption Management

Significant cost underestimations were identified:

Cost Component	Initial Estimate	Validated Cost	Variance
Security Certification	¥120,000	¥200,000	+66.7%
Market Data	¥60,000	¥100,000	+66.7%

Licensing			

- Established an assumption tracking protocol:
  - User growth rate: Baseline ±15% variance boundary
  - Infrastructure costs: ±20% fluctuation range
  - Mitigation: ¥500,000 liquidity reserve allocation

7.2.4 Systemic Analysis Methodology

Rectified initial omission of VAT credit carryforward provisions
Quantified user growth rate as primary sensitivity factor (coefficient: 3.26)

7.2.5 Economic Evaluation Insights

Identified AI advisory module as suboptimal investment (68% development cost vs 41% revenue contribution)

Executed strategic deferral of non-core components, reducing development timeline by 3months

Established continuous monitoring protocol with monthly financial health assessments.