# 1 The idea

Our **AI-powered portfolio management system** uses advanced automation to analyse market trends, optimise portfolios, and execute trades in real-time. By integrating live data feeds, risk analysis, and predictive modeling, it creates strategies that **maximise returns and minimise** risks, easing investment tasks for both individuals and institutions.

This project will launch as a **fintech start-up**, aiming to challenge traditional investment management with AI-driven solutions. Initially, we will target **retail investors, wealth managers**, and **hedge funds** via a **SaaS model**. We plan to seek venture capital for growth, form strategic partnerships, and eventually explore enterprise licensing for larger institutions while ensuring global regulatory compliance.

The initial development team will consist of **12-16** members, with expertise in AI/ML, software development, financial analysis, data science, security, and compliance. Key roles are shown in Table 1:

| **Role** | **Team Size** | **Responsibilities** |
|---|---|---|
| AI/ML Engineers | 3-4 | Build predictive models and optimisation algorithms |
| Backend Developers | 2-3 | Develop APIs, automation, and trade execution features |
| Frontend/UI Developers | 2 | Design user-friendly dashboards and interfaces |
| Data Scientists | 2 | Process and analyse financial data streams |
| Compliance and Security Experts | 1-2 | Ensure regulatory compliance and system security |
| Product Managers and Business Analysts | 2-3 | Oversee product strategy, and market fit |

Table 1: Development Team Structure

**Initial team size:** 12-16, expanding as the company scales.

# 2 Project plan

The project focuses on leveraging machine learning and data analytics to optimise commodity trading. By providing data-driven decision-making tools, the platform aims to give users a competitive edge in the market. The project will proceed through four main phases: Research, Development, Integration, and Launch.

The work packages for the project, with their respective durations and responsibilities, are as follows:

1. **Project Initiation (3 days)**: Define objectives, scope, and strategy.
2. **Market Research (20 days)**: Analyse trends to inform system design.
3. **Regulatory and Compliance Analysis (7.5 days)**: Ensure adherence to industry standards.
4. **Technology Stack Planning (5 days)**:Establish architecture for scalability and security

5. **AI Model Development (15 days)**: Build predictive trading algorithms.
6. **Backend and Frontend Development (22 & 23 days)**: Implement core functionalities.
7. **Security and Compliance Implementation (9 days)**: Integrate regulatory and cybersecurity measures.
8. **System Integration and Testing (8 days)**:Validate system performance and reliability.
9. **Beta Test and User Feedback (1 day)**: Collect user feedback for refinements.
10. **Compliance Review (5 days)**: Conduct regulatory verification.
11. **Full Launch (2 days)**: Deploy the system and ensure operational stability.

## Resources and Allocation

Key resources for the project include:

- **Project Manager**: Monitors the project's progress and ensures goals are met.
- **Data Scientists and Machine Learning Engineers**: Responsible for building AI models and algorithms.
- **Developers (Backend, Frontend)**: Focus on the system's development and integration.
- **Legal, Compliance, and Cybersecurity Experts**: Ensure the system's regulatory compliance and security standards are met.

The project will be managed through a well-defined **Work Breakdown Structure (WBS)**, with each phase and task tracked to ensure timely completion. Risk management will be particularly important during the AI model development and system integration phases. The project begins on **17 March 2025** and culminates with a full system launch on **7 October 2025**. Key deliverables are tracked through the project's **WBS** (Figure 1) and **Gantt chart** (Figure 2), providing a clear overview of goals and dependencies.

| Name | Duration | Start | Finish | Predecess... | Resource Names |
|---|---|---|---|---|---|
| Project Initiation | 3.333 days | 17/03/25 08:00 | 20/03/25 10:40 | | Project Manager;Business Analyst[50%] |
| Market Research | 20 days | 24/03/25 08:00 | 18/04/25 17:00 | 1 | Market Research Analyst;Business Analyst[50%] |
| Regulatory and Compliance Analysis | 7.5 days | 14/04/25 08:00 | 23/04/25 13:00 | | Legal Advisor;Compliance Specialist |
| Technology Stack Planning | 5 days | 06/05/25 08:00 | 12/05/25 17:00 | 3 | CTO;Software Architect |
| AI Model Development | 15 days | 23/05/25 08:00 | 12/06/25 17:00 | 4FS+3 days | Data Scientists;Machine Learning Engineers |
| Backend Develeopment | 22 days | 09/07/25 08:00 | 07/08/25 17:00 | 5FS+3 days | Backend Developers;DevOps Engineers[50%] |
| Frontend Development | 23 days | 14/07/25 08:00 | 13/08/25 17:00 | 5FS+2 days | Frontend Developers;UI/UX Designers[50%] |
| Security and Compliance Implementation | 9 days | 14/08/25 08:00 | 26/08/25 17:00 | 6;7 | Cybersecurity Specialist;DevOps Engineers[50%];Compliance Specialist[50%] |
| System Integration and Testing | 8 days | 29/08/25 08:00 | 09/09/25 17:00 | 8FS+2 days | QA Engineers;Software Testers;DevOps Engineers[50%] |
| Beta Test and User Feedback | 0.114 days | 11/09/25 08:00 | 11/09/25 08:54 | 9FS+1 day | Product Manager[50%];UX Researchers;Beta Testers |
| Compliance Review | 5 days | 22/09/25 08:00 | 26/09/25 17:00 | 10 | Compliance Specialist[50%];Legal Advisor[50%] |
| Full Launch | 2 days | 06/10/25 08:00 | 07/10/25 17:00 | 11 | Project Manager;Marketing Team;IT Support[50%] |

Figure 1: Timeline

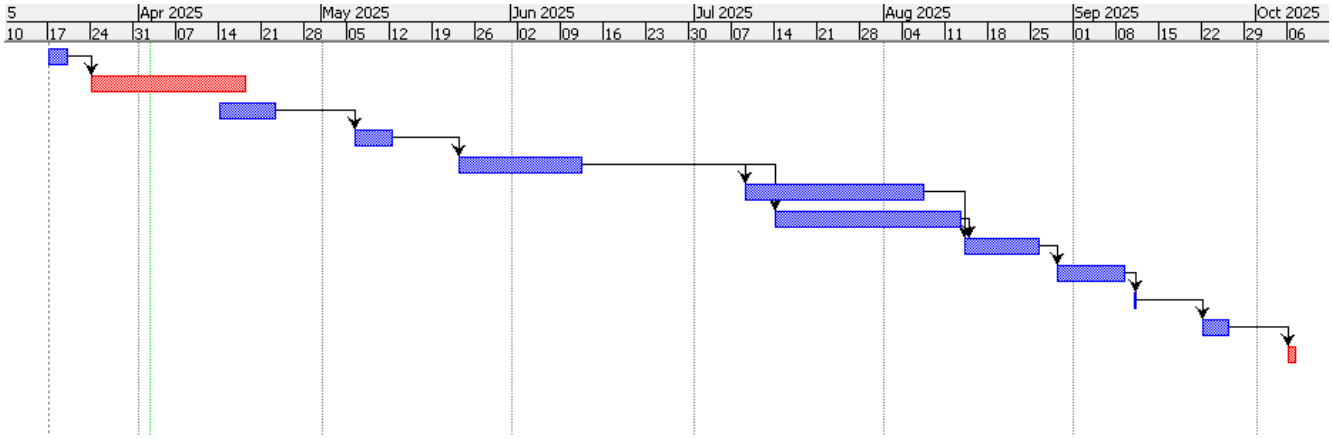


Figure 2: Gantt Chart

# 3 Budget

The increasing demand for AI-powered solutions in commodity trading opens up significant opportunities for **financial institutions, hedge funds,** and **traders** to optimise their portfolios [1]. Our platform provides predictive analytics, automated trading, and real-time insights tailored for commodities markets. Below, we provide a breakdown of the **total capital expenditure** for the first year, as illustrated in Table 2:

| **Expense Category** | **Estimated Cost (GBP)** |
|---|---|
| **Development Costs** | **200,000** |
| Software Development (AI, UI/UX) | 120,000 |
| Cloud Infrastructure (AWS, Azure) | 40,000 |
| Data Acquisition | 25,000 |
| API Integrations (Market Data) | 15,000 |
| **Operational Costs** | **45,000** |
| Server Hosting | 20,000 |
| Maintenance | 15,000 |
| Security | 10,000 |
| **Legal and Compliance** | **23,000** |
| Regulatory Compliance (GDPR, MiFID II) | 15,000 |
| Legal Consulting | 8,000 |
| **Marketing and Sales** | **45,000** |
| Advertising | 25,000 |
| Customer Acquisition | 20,000 |
| **Miscellaneous** | **42,000** |
| Training and Development | 12,000 |
| Contingency Fund (10%) | 30,000 |
| **Total Capital Expenditure** | **355,000** |

Table 2: Capital Expenditure Breakdown

# Operating Costs

Once the platform is fully operational, the annual operating costs will be crucial to ensure its continuous growth and sustainability. These costs are outlined below:

- Server Hosting: £20,000/year
- Maintenance: £15,000/year
- Security: £10,000/year
- Advertising: £25,000/year
- Customer Acquisition: £20,000/year

**Total Operating Costs: £45,000/year**

**Total Marketing & Sales: £45,000/year**

**Total Annual Operating Costs: £90,000**

## Income Projections

The following projections represent a realistic growth trajectory over the **first three years**, with gradual scaling in user acquisition and platform adoption.

### Year 1:

- **Premium Users (Institutional Clients)**: 50 users × £2,000 = £100,000
- **Standard Users (Individual Traders)**: 200 users × £500 = £100,000

$$\text{Total Revenue for Year 1} = £\mathbf{200,000}$$

### Year 2:

- **Premium Users (Institutional Clients)**: 150 users × £2,000 = £300,000
- **Standard Users (Individual Traders)**: 700 users × £500 = £350,000

$$\text{Total Revenue for Year 2} = £\mathbf{650,000}$$

### Year 3:

- **Premium Users (Institutional Clients)**: 400 users × £2,000 = £800,000
- **Standard Users (Individual Traders)**: 1,600 users × £500 = £800,000

$$\text{Total Revenue for Year 3} = £\mathbf{1,600,000}$$

### Break-even Analysis

Given the **capital expenditure** of **£355,000**, the projected revenue for **Year 1** is **£200,000**. Based on these figures, the break-even point is calculated as follows:

$$\text{Break-even Point} = \frac{355,000}{200,000} = 1.775\,\text{years} \approx \mathbf{21.5}\,\text{months}$$

This indicates that the project is expected to reach its break-even point in approximately **21.5 months**.

To provide a clearer understanding of the growth trajectory, we apply a **logarithmic growth** model to account for the initial slow adoption and subsequent acceleration in user acquisition. The model is based on the following equation [2]:

- $a$, $b$, and $c$ are parameters that calibrate the model
- $t$ represents time, reflecting the scaling of user adoption

$$\text{ROI}(t) = a \cdot \log(b \cdot t + 1) + c$$

This model supports the observed **gradual early-stage adoption** followed by **rapid growth**. It helps explain how the platform can break even after **21.5 months** and continue growing thereafter, as illustrated in the ROI chart below.

### ROI Calculations

The **Return on Investment (ROI)** for the first three years is calculated as follows:

- **Year 1 ROI:**
$$\frac{200,000 - 355,000}{355,000} \times 100 = \mathbf{-43.66}\%$$
- **Year 2 ROI:**
$$\frac{650,000 - 355,000}{355,000} \times 100 = \mathbf{83.61}\%$$
- **Year 3 ROI:**
$$\frac{1,600,000 - 355,000}{355,000} \times 100 = \mathbf{351.4}\%$$

The first year typically involves significant upfront investment, with profitability expected to accelerate from Year 2 onwards.

The graph below (Figure 3) illustrates the 3-month ROI trajectory after deployment. It clearly demonstrates the slow initial adoption followed by a phase of rapid growth.

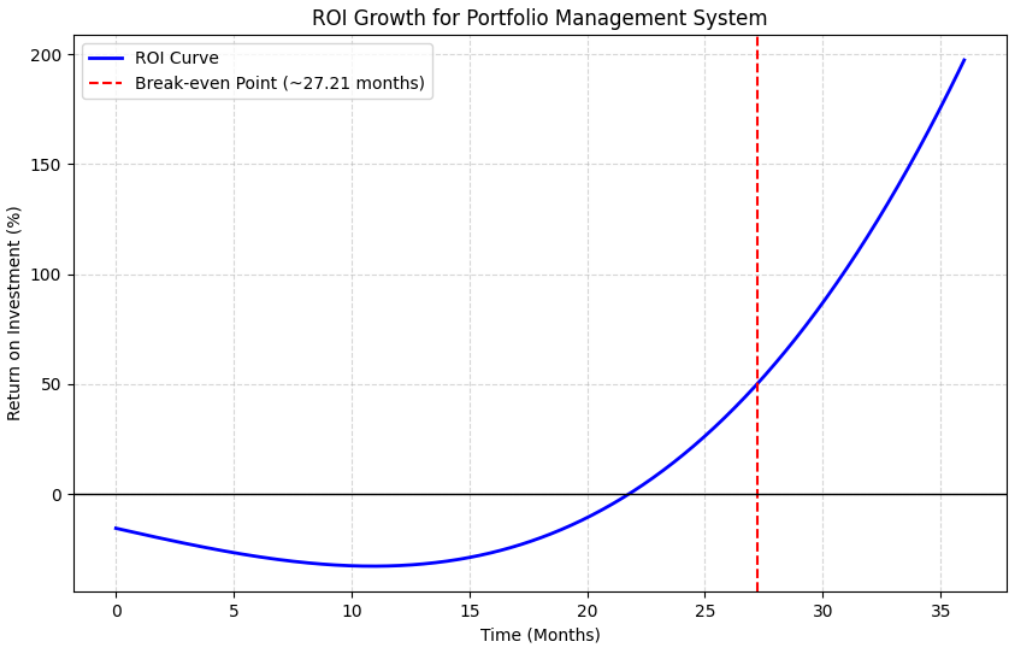


Figure 3: Graph showing ROI over time

The logarithmic model aligns with our expectations, predicting the break-even point at **21.5 months**, after which the platform will experience accelerated growth and increasing ROI.

## Legal and Ethical Considerations

### Legal Framework

The system must comply with key financial regulations, such as:

- **FCA Regulations** (Financial Conduct Authority): Ensures investor protection and transparency in financial markets.
- **MiFID II** (Markets in Financial Instruments Directive II): Ensures transparency and investor protection, particularly in financial markets.[3]
- **GDPR** (General Data Protection Regulation): Ensures data privacy and protection, applying to personal data handling and storage.
- **AML** (Anti-Money Laundering) and **KYC** (Know Your Customer): Laws to prevent financial crime and ensure compliance with international standards.

These regulations ensure ethical AI usage and safeguard investor interests while fostering a transparent financial environment.

### Geo-Political Implications

Operating across multiple jurisdictions introduces challenges such as:

- **Regulatory Divergence**: Different regions may have varying regulations, especially after major regulatory shifts, such as post-Brexit or other geopolitical changes. Compliance with both regional and international laws is necessary. [4]
- **Data Protection Differences**: Regions may have different data protection laws, requiring the platform to adjust its data handling practices for compliance with diverse regulations.
- **Geopolitical Risks**: Trade restrictions, financial sanctions, and political shifts can affect global partnerships, impacting operations and data-sharing agreements. [5]

These factors necessitate adaptable strategies to comply with local and international laws, while navigating geopolitical risks.

### Ethical Implications

Key ethical considerations include:

- **Bias and Fairness**: AI models must be designed to avoid bias, ensuring equitable investment recommendations across demographics.
- **Transparency**: The platform must ensure transparency in its AI-driven decision-making processes, following the principles of explainable AI (XAI).
- **Data Privacy**: Compliance with data protection laws is critical to ensure secure handling of personal data and adherence to privacy-by-design principles.
- **Responsible AI Development**: Continuous auditing of the system to ensure compliance with ethical standards, preventing algorithmic manipulation and promoting fairness.

### Stakeholder Impact

The AI-powered system impacts various stakeholders, as shown in the table below:

| Stakeholder | Positive Impact | Negative Impact |
|---|---|---|
| **Retail Investors** | Access to AI-driven insights, improved financial inclusion | Potential over-reliance on AI, loss of personal financial control |
| **Institutional Investors** | Efficient portfolio management, automated risk assessment | Job displacement in traditional fund management |
| **Regulators** | Improved transparency and market monitoring | Challenges in overseeing AI decision-making |
| **Financial Advisors** | AI-assisted recommendations improve service quality | Need for upskilling to integrate AI |

Table 3: Stakeholder Impact Analysis

### Responsible Innovation

To ensure responsible innovation, the following measures will be adopted:

- Conduct regular ethical reviews exploring alternatives to AI decision-making, balancing automation with human oversight.

- Integrate ethical AI principles into the project charter, ensuring fairness and transparency.
- Maintain comprehensive documentation of development processes, data handling, and AI training methodologies.
- Promote a culture of ethics within the company, encouraging ethical AI practices at all stages of development.

By addressing these legal and ethical concerns, we ensure compliance with relevant regulations, maintain transparency, and promote responsible AI use, benefiting all stakeholders while mitigating risks.

**PESTLE Analysis**

CIPD

# PESTLE template

| | External factors to consider | Factors affected within my industry | Importance to organisation |
|---|---|---|---|
| **Political** | Government policy<br>Political stability<br>Tax<br>Industry regulations<br>Global trade agreements and or restrictions | - Stricter financial regulations (e.g. MiFID II, GDPR) could impose additional compliance costs and require frequent updates to the platform.<br><br>- Potential changes in corporate taxation or financial transaction taxes may impact profitability.<br><br>- Brexit and other trade restrictions may limit access to certain markets, affecting cross-border operations. | High – Compliance is crucial for market access and credibility |
| **Economic** | Exchange rates<br>Globalisation<br>Economic growth/ decline<br>Inflation<br>Interest rates<br>Cost of living<br>Labour costs<br>Consumer spending habits | - Economic downturns or crises may make traders less willing to take risks, slowing subscription growth.<br><br>- Fluctuating exchange rates may impact international revenue streams and data acquisition costs.<br><br>- Growing demand for AI in finance presents an opportunity, but recessions could slow investment in new technology. | Medium – Revenue is tied to market stability but mitigated by increasing AI adoption in finance. |
| **Social** | Consumer trends/ tastes,<br>Fashions<br>Consumer buying habits<br>Lifestyle factors<br>Career attitudes<br>Work-life balance<br>Population demographics | - Traditional traders and institutional investors, unfamiliar with AI-driven decision-making, may be reluctant to adopt the platform.<br><br>- Skilled AI and finance professionals are essential but may be costly to recruit and retain.<br><br>- A shift towards algorithmic trading and data-driven strategies increases demand but requires education and trust-building. | Medium – Overcoming skepticism through strong marketing and user education is crucial. |

| | External factors to consider | Factors affected within my industry | Importance to organisation |
|---|---|---|---|
| **Technology** | Automation<br>Innovation<br>Disruptive technologies<br>Social networking<br>Upgrades<br>Robotics<br>Artificial Intelligence<br>Security | - Shifting exchange rates may impact global revenue and data costs.<br><br>-Cyber threats, including data breaches and AI model manipulation, could damage credibility and lead to financial losses.<br><br>- Ensuring the platform can handle large datasets and real-time trading volumes without performance issues. | High – Continuous investment in R&D and security is crucial to maintaining a competitive edge. |
| **Legal** | Employment law<br>Common law<br>Local labour law<br>Health and safety regulations | - The platform must comply with GDPR, MiFID II, and other financial data protection laws, requiring ongoing legal oversight<br><br>- Agreements with data providers, clients, and financial institutions must be managed carefully to avoid legal issues<br><br>- Compliance with global labour laws, especially for remote teams, is crucial | High – Legal compliance is crucial for business continuity. |
| **Environmental** | Environmental restrictions imposed by in-country governments<br>Sustainable resources<br>CSR (Corporate social responsibility)<br>Ethical sourcing<br>Transportation<br>Procurement<br>Supply chain management<br>Future pandemics | - Growing demand for ESG (Environmental, Social, and Governance) investing may require additional data integration for ethical commodity trading<br><br>- AI and cloud computing require significant power, so optimising for sustainability could improve market positioning<br><br>- Future carbon taxes or restrictions on commodity trading (e.g. fossil fuels) could impact business operations | Medium – Sustainability initiatives can enhance long-term credibility but have limited short-term operational impact. |

# 4 Sustainability

### Meeting the APM Competence Framework (3rd Edition)

This portfolio management system aligns with the **APM Competence Framework (3rd Edition)**[6] by demonstrating key project management competencies. Below is an outline of how we meet each core competency:

1. **Life Cycles**: The project is structured into distinct phases: concept development, AI model creation, data integration, compliance verification, and deployment. We will adopt an agile methodology to ensure flexibility and continuous optimisation. The project will follow the standard life cycle stages: initiation, planning, execution, monitoring, and closure, ensuring clarity and alignment with the project's objectives.

2. **Governance Arrangements**: A governance framework consisting of senior stakeholders, legal advisors, financial analysts, and technical leads will oversee the project. Clearly defined roles and responsibilities, supported by a steering committee, will ensure compliance with both internal and external standards while achieving organisational objectives.

3. **Sustainability**:

   - **Environmental Considerations**: We are committed to minimising environmental impact by utilising **green cloud technologies** [7] to reduce energy consumption. Additionally, we will adopt responsible hardware management and recycling practices, aligning with **SDG 12: Responsible Consumption and Production**.

   - **Social Considerations**: The platform promotes financial inclusion by providing AI-driven tools for retail investors and underserved communities, supporting **SDG 10: Reduced Inequalities**.[8] Our AI models will be designed to ensure fairness and avoid biases, contributing to **SDG 16: Peace, Justice, and Strong Institutions**. [8]

   - **Economic Considerations**: The SaaS model of the platform enables scalability and affordability, fostering growth opportunities for both small and large-scale investors, and supporting **SDG 8: Decent Work and Economic Growth.**[8]

   - **Administrative Considerations**: We will implement ongoing compliance checks (e.g. GDPR, MiFID II) to ensure adherence to legal and regulatory requirements. This safeguards the platform against disruptions, aligning with **SDG 16: Peace, Justice, and Strong Institutions.**[8]

4. **Financial Management**: A comprehensive financial plan will guide the project to ensure viability throughout its lifecycle. We will allocate resources effectively for AI development, data integration, security, and compliance. Regular cost-benefit analyses will guarantee that the project optimises returns and minimises waste, aligning with **SDG 9: Industry, Innovation, and Infrastructure** [9], while fostering sustainable growth.

5. **Business Case**: The initial business case emphasises the need for AI-powered portfolio management, including financial projections, risk assessments, and benefits. This business case will be updated periodically to reflect technological advancements, market conditions, and regulatory changes, ensuring its continued relevance. This iterative process supports **SDG 17: Partnerships for the Goals** [9] by promoting collaboration with stakeholders.

6. **Portfolio Shaping**: The project will align with strategic objectives, ensuring both short- and long-term goals are achieved through well-defined phases. Regular reassessments

will ensure alignment with customer needs, technological advancements, and regulatory requirements, supporting **SDG 17: Partnerships for the Goals** [9] and **SDG 9: Industry, Innovation, and Infrastructure.**[9]

By adhering to the **APM Competence Framework**, our AI-powered portfolio management system remains adaptable, sustainable, and aligned with stakeholder needs. The project also supports global sustainability goals, particularly in **financial inclusion (SDG 10), ethical AI (SDG 16), responsible consumption (SDG 12), and innovation (SDG 9),** making a significant contribution to the **2024 SDG progress** report [8].

# 5 Risk

## 5.1 Risk Register

***Step 5 - Responding using the response/action plan***

**Task:** Risk assessment for AI-powered trading platform

**Update:** 20/03/2025

**Assessment by:** Sujn Subanthran

CIRIA — *sharing knowledge + building best practice*

***Top 10 risks***

| Item No | Area | Risk summary | Likely start of risk period | Likely end of risk period | Likelihood | Consequence | Risk rating | Control strategy | Control strategy cost | Owner | Action when | Residual likelihood | Residual consequence | Residual risk rating | Risk control strategy in place yet ? (Y/N) | Risk control strategy reference |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Market Volatility | Commodity price fluctuations impact trading performance | Ongoing | Ongoing | High | High | Critical | Implement AI- driven risk management models | £20,000 | Risk Manager | Before Launch | Medium | High | Moderate | Y | AI Risk Model v1.2 |
| 2 | Regulatory Compliance | Non-compliance with financial regulations (GDPR, MiFID II) | Pre-Launch | Ongoing | Medium | High | High | Ensure legal compliance with ongoing audits | £15,000 | Compliance Officer | Before Launch | Low | High | Moderate | Y | Compliance Framework 2024 |
| 3 | Cybersecurity | Data breaches and hacking attempts | Pre-Launch | Ongoing | High | High | Critical | Implement advanced encryption, penetration testing and monitoring | £25,000 | CTO | Before Launch + Ongoing | Low | High | Moderate | Y | Cybersecurity Plan v3.1 |
| 4 | AI Model Accuracy | Innacurate predictions leading to poor trading decisions | Pre-Launch | Ongoing | Medium | High | High | Continuous AI model training and validation | £30,000 | Lead Data Scientist | Ongoing | Low | Medium | Low | Y | AI Model Validation Process |
| 5 | User Adoption | Slow initial user acquisition | Launch | Year 2 | Medium | Medium | Moderate | Targeted marketing and education campaigns | £45,000 | CMO | 3 months pre-launch | Low | Medium | Low | Y | Marketing Strategy 2024 |
| 6 | System Downtime | Technical failures causing service disruptions | Ongoing | Ongoing | Medium | High | High | Robust cloud infrastructure and redundancy | £40,000 | CTO | pre-launch and continuous | Low | High | Moderate | Y | Infrastructure Redundancy Plan |
| 7 | Data Quality | Inaccurate or delayed market data affecting trades | Ongoing | Ongoing | Medium | High | High | Use multiple reliable data sources and real time validation | £25,000 | Data Engineer | Before Launch | Low | Medium | Low | Y | Data Quality Assurance Process |
| 8 | Competition | Market competitors offering similar AI solutions | Ongoing | Ongoing | Medium | Medium | Moderate | Continuous innovation and feature upgrades | £50,000 | CEO | Ongoing | Low | Medium | Low | Y | Product Roadmap Strategy 2024 |
| 9 | Investor Confidence | Failure to meet ROI expectations | Year 1 | Year 3 | Medium | High | High | Transparent reporting, milestone tracking, and investor updates | £10,000 | CFO | Quarterly | Low | Medium | Low | Y | Investor Relations Plan |
| 10 | Scalability Issues | Platform struggling with increased users | Year 1 | Ongoing | Medium | High | High | Scalable cloud infrastructure and performance monitoring | £35,000 | CTO | Continuous | Low | Medium | Low | Y | Scalability Plan 2024 |

Figure 4: Risk Register - Ciria

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