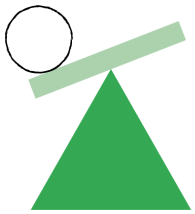
Errors + Grace Failure

Chapter worksheet



Instructions

Block out time to get as many cross-functional leads as possible together in a room to work through these exercises & checklists.

Exercises

1. Error audit [~1 hour]

Collect canonical error examples to define existing and potential errors and solutions.

2. Quality assurance [~30 minutes]

Prioritize how you'll test and monitor errors and reporting so you can hear from your users early and often.

Error Audits Examples for Stock Price Prediction:

One common error in stock price prediction occurs when the AI model fails to predict accurately during times of market volatility, such as during an economic crisis or sudden global event. While the model might perform well under stable conditions, it struggles when market conditions change drastically. This happens because the AI was trained mostly on past data from normal market conditions and doesn't have enough examples of chaotic situations to make good predictions during these times.
To address this, the model needs to be retrained with more diverse data that includes examples of both stable and volatile markets. Additionally, the AI should recognize when the market is unpredictable and warn users about potential inaccuracies in its predictions, prompting them o take caution and consider other factors before making investment decisions.

Another error arises when the AI doesn't account for significant changes in the broader economy, such as new government regulations, global pandemics, or other disruptive events. the AI, relying solely on historical data, might assume that past trends will continue, even when current conditions have drastically changed. To fix this, the model should be regularly updated with the latest economic data and factors that influence stock prices, allowing it to adjust its predictions accordingly. The AI should also be equipped with a feature that detects when the market is undergoing significant shifts and alert users that historical data may not be as reliable during these times, encouraging them to do further research or seek additional input.

Quality Assurance for Stock Price Prediction Systems:

For stock price prediction systems to work effectively, a strong quality assurance process must be in place. This involves thoroughly testing the AI in various market conditions, including sudden changes like market crashes, surges, or unpredictable events. Simulating these real-world scenarios helps ensure that the AI can handle different environments and still make reasonable predictions. Continuous monitoring of the system is equally important by tracking prediction errors and observing how the AI performs during unexpected market events, the system can be adjusted and fine-tuned as needed. Additionally, gathering feedback from users, such as investors or traders, can help improve the AI's predictions. If users notice that the AI's predictions don't match actual market outcomes, they should be able to report these discrepancies, creating a feedback loop that helps the model improve over time. This combination of testing, monitoring, and user feedback will ensure the AI remains reliable, accurate, and responsive to changing market conditions.

1. Error audit

As a team, brainstorm what kinds of errors users could encounter. If your team has a working prototype of your feature, try to add current examples.

Use the template below to start collecting error examples so your team has a shared understanding about the different error types and solutions your model could produce.

Error

AI model predicts stock prices accurately during stable market conditions but fails to provide reliable predictions during periods of high market volatility or sudden global events. The Evidence could be Logs showing high deviations between predicted and actual stock prices during events like a financial crisis or sudden market crashes

Error type

- ☐ **System limitation** - Your system can't provide the right answer, or any answer at all, due to inherent limitations to the system.
- ☑ **Context** - The system is “working as intended,” but the user perceives an error because the actions of the system aren't well-explained, break the user's mental model, or were based on poor assumptions.
- ☐ **Background** - Situations in which the system isn't working correctly, but neither the user nor the system register an error.

Users

Investors or traders

User stakes

- ☐ low
- ☑ high

Inaccurate predictions during times of market volatility can lead to significant financial losses for investors who rely on the AI’s forecasts

Error sources

Take each error identified above through these questions to determine the source of the error:

Input error signals

- [ ] Did the user anticipate the auto-correction of their input into an AI system?
- [x] Was the user's habituation interrupted? **(If your interface or prediction display changed frequently.)**
- [ ] Did the model improperly weigh a user action or other signal? If yes, likely a context error.

Relevance error signals

- [x] Is the model lacking available data or requirements for prediction accuracy?
- [x] Is the model receiving unstable or noisy data?
- [x] Is the system output presented to users in a way that isn't relevant to the user's needs?

System hierarchy error

- [ ] Is your user connecting your product to another system, and it isn't clear which system is in charge?
- [ ] Are there multiple systems monitoring a single (or similar) output and an event causes simultaneous alerts? Signal crashes increase the user's mental load because they have to parse multiple signals to figure out what happened and what to do next.

Failure state

- [x] Is your feature unusable as the result of multiple errors?

(If multiple issues, such as data inaccuracy or irrelevant outputs, render the predictions unreliable.)

Error resolution

Once you have identified the source or sources of the error, complete the sections below for each of the errors in the template with your team's plan for improving / reducing the identified error: Create as many copies as you need to cover all your identified errors.

Error rationale Why the user thinks this is an error:	**Solution type**
Users expect accurate predictions even during volatile markets. When the model fails during such times, it leads to poor financial decisions, which users perceive as an error due to their reliance on consistent performance.	☑ Feedback ☑ User control ☐ Other:

Error resolution

User path:

The user notices incorrect predictions during volatile markets, provides feedback, and receives a warning about the model's lower confidence in volatile conditions.

Opportunity for model improvement:

Feedback is logged for model tuning, allowing the system to improve predictions during volatility by incorporating real-time market condition detection.

2. Quality assurance

Getting your feature into users' hands is essential for identifying errors that your team, as expert users, may never encounter. Meet as a team to prioritize how you want to monitor errors reported by users so that your model is being tested and criticized by your users early and often.

As you have this discussion, consider all potential sources of error reporting:

- Reports sent to customer service
- Comments and reports sent through social media channels
- In-product metrics
- In-product surveys
- User research (out-of-product surveys, deep dive interviews, diary studies, etc.)

QA template

Goal **is to ensure the accuracy and relevance of stock price predictions, during volatile market conditions. Monitor user feedback and prediction performance to improve the model.**	**Review frequency** ☑ Daily ☐ Weekly ☑ Monthly ☐ Other:
Method **Monitor prediction accuracy through in-product metrics, analyze user feedback, review error logs for volatility-related deviations, and conduct monthly user research.**	
Start date: **October 1, 2024.** Review / End date: **Continuous monitoring**	