

# Integrating Real-Time Analytics into Shoe Inventory Management: A Pathway to Predictive Decision-Making

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## INTRODUCTION

Embracing the digital shift in retail, this project pioneers the use of Artificial Intelligence (AI) for enhancing shoe inventory management. We aim to create a predictive analytics system employing machine learning to accurately forecast demand and pricing trends in the dynamic footwear market.

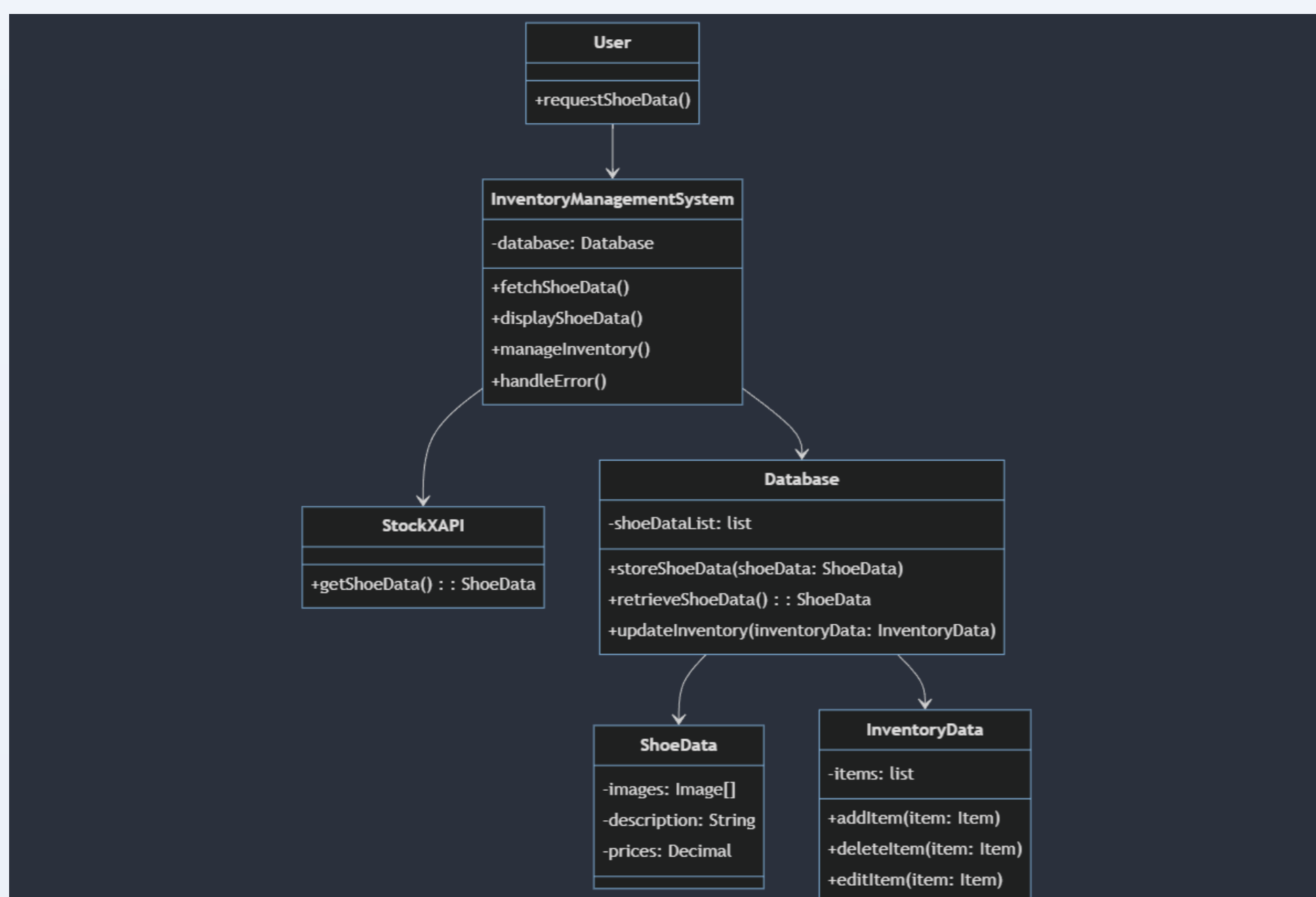
## OBJECTIVES

In this project, we aim to develop an AI-based predictive model that forecasts shoe demand and pricing trends, integrating real-time market data from the StockX API for enhanced accuracy. A key goal is to create a user-friendly interface for streamlined inventory management, using advanced technologies for optimal user experience.

Additionally, we focus on ensuring the accuracy and integrity of data through robust methods, while optimising inventory management processes to reduce stock discrepancies. The system is designed to not only support informed decision-making but also to be scalable, accommodating growing data and user demands..

## METHODOLOGY

Our methodology integrates TypeScript, ReactJS, and Electron for a robust front-end, and a scalable Express with Node.js back-end. Prisma facilitates database management, while the StockX API provides real-time pricing data.



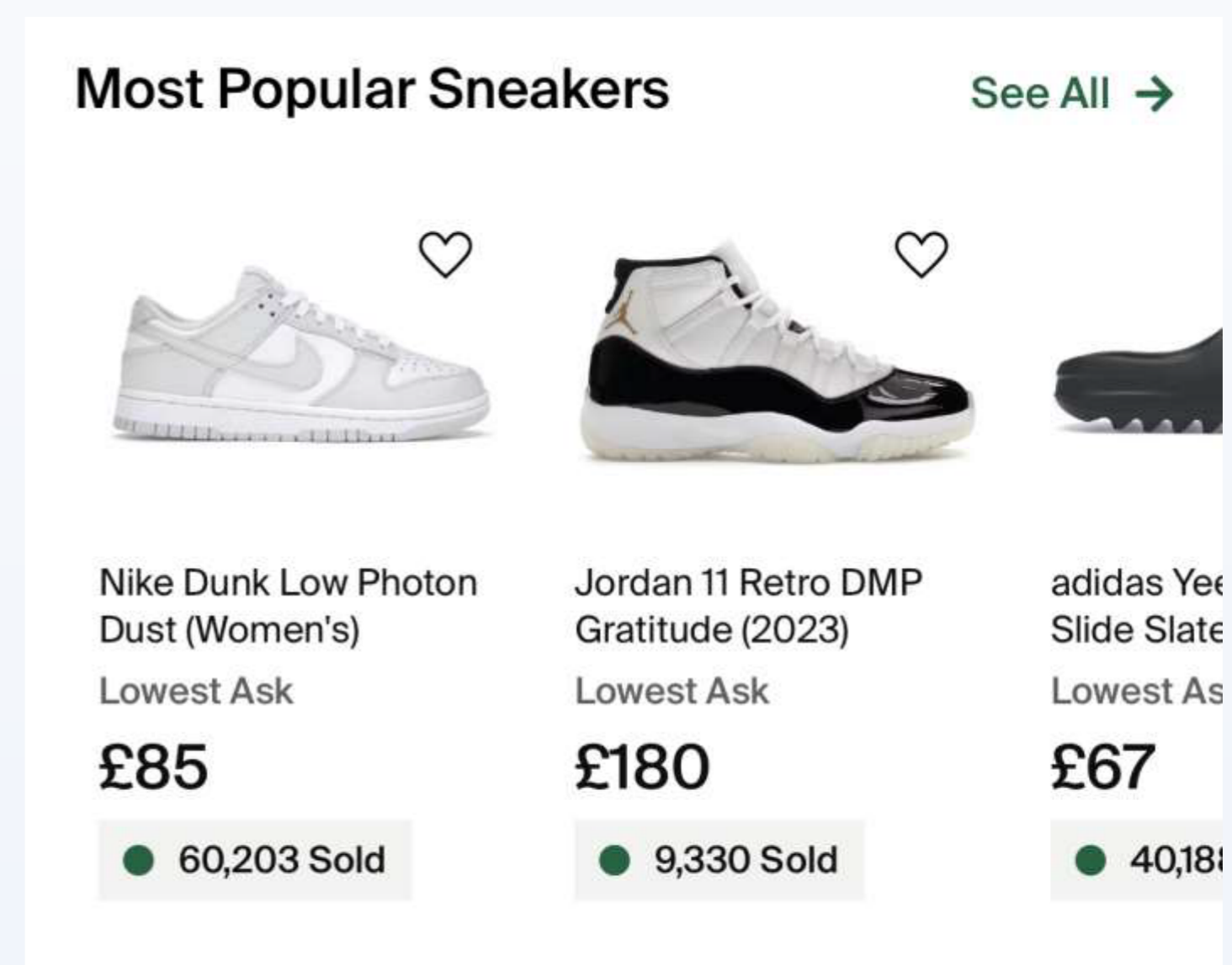
## RESULTS

To date, the project has achieved significant milestones. We have successfully integrated the StockX API, enabling real-time tracking of shoe prices, with updates occurring at 30-minute intervals. This functionality is critical for maintaining up-to-date inventory assessments and will serve as the backbone for future predictive analytics features. Illustrated below is a snapshot showcasing the first shoe item added to our database.

id	sku	name	brandId	colorway	desc
1	CT8012-170	Jordan 11 Retro DMP Gratitude (2023)	1	Black/White/Metallic Gold	The Jordan 11 Retro Gratitude / Defining Moments (...)

## CHALLENGES AND SOLUTIONS

We encountered a significant challenge with StockX's anti-bot captcha, which restricted automated access to their pricing data for the 'Popular' category. In adherence to ethical data use and respect for platform security measures, we have redirected our efforts towards alternative data collection methods that align with our project goals and maintain compliance with usage policies.



## CURRENT ACHIEVEMENTS AND FUTURE DIRECTIONS

To date, our project has successfully integrated key technologies and established a real-time tracking system for shoe prices. With the initial phase complete, our next steps involve developing machine learning models for predictive analytics. Our ongoing efforts are geared towards leveraging AI to revolutionise inventory management in the footwear industry, maintaining a strong emphasis on ethical data use and system security.

As part of the ongoing development process, I aim to implement features such as an analytics tab which will display values such as a Total Collection Value.

Further implementations include the use of a Time Series Model and Forecast Model as part of the aforementioned analytics tab.