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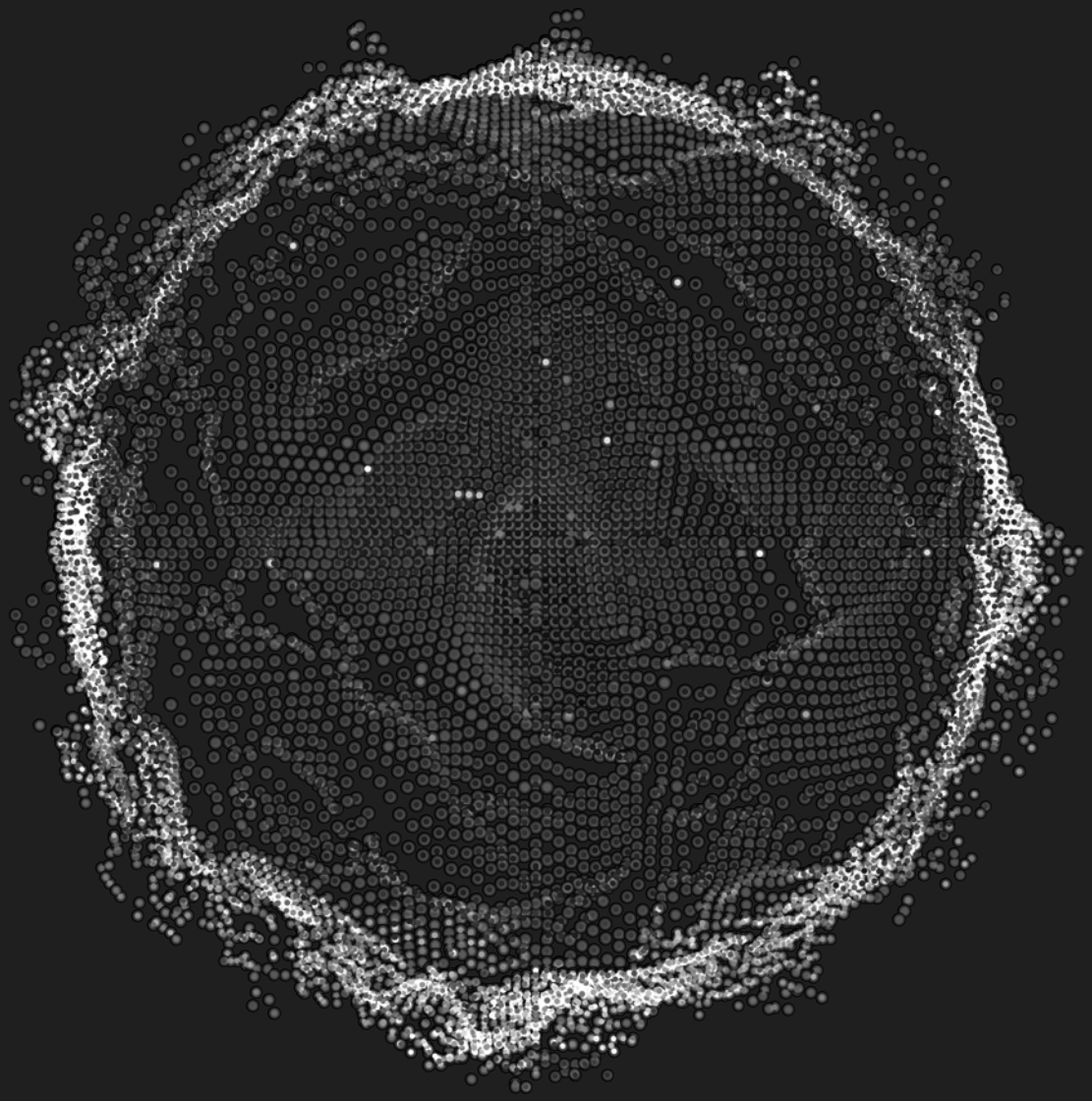

# ALIEN INTELLIGENCE IN THE BOARDROOM

Generative AI's Innovative New Market Strategies

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**ABOUT THE AUTHOR:**

Dr. Uri Yerushalmi is Co-founder & Chief AI Officer at Fetcherr and a computational neuroscientist with a Ph.D. in Computational Neuroscience. With over three decades of experience in software development and artificial intelligence, he is a seasoned AI algorithmic trader, researcher, manager, and programmer. Formerly the CEO and Head of AI at a leading algorithmic trading firm, Dr. Yerushalmi blends deep technical expertise with extensive experience in business management and entrepreneurship.

**ABOUT FETCHERR:**

Founded in 2019 by experts in deep learning, algorithmic trading, e-commerce, and digitization, Fetcherr is disrupting traditional systems with its cutting-edge AI technology. At its core is the Large Market Model (LMM), an adaptable AI engine that precisely forecasts demand and market trends, empowering real-time decision-making. Initially specializing in the airline industry, Fetcherr aims to revolutionize various industries with dynamic, AI-driven solutions.

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## INTRODUCTION

In today's rapidly changing business environment, artificial intelligence (AI) technologies are reshaping how companies understand and interact with markets. While much attention has been given to AI systems that mimic human cognition – like perception, reasoning, and communication – the true revolution lies in AI's ability to surpass human intelligence in complex data analysis and market prediction.

Traditional AI models focus on processing natural human data such as text, voice, images, and video. Humans have evolved to excel in understanding these types of data, and AI has made significant strides in replicating these abilities. However, there's a realm of data where human cognitive abilities are limited: complex, non-natural environments like financial and business markets. Here, AI has the potential not just to mimic but to exceed human intelligence.

This white paper explores how Fetcherr leverages this opportunity through its Large Market Model (LMM), an innovative generative AI system designed to decode intricate market behaviours and forecast financial trends with unprecedented accuracy. By focusing on non-natural data environments, Fetcherr's AI transcends traditional human limitations, offering businesses a powerful tool to navigate market volatility and optimize decision-making.

We will delve into two distinct pathways for AI development to surpass human intelligence:

**Training on Natural Human Data:**
Enhancing AI capabilities in areas where humans naturally excel, such as language and image recognition, by processing vast amounts of data more efficiently.

**Training on Non-Natural, Human-Unadapted Data:**
Developing AI systems that operate in complex environments like financial markets, where human cognitive abilities are not naturally adapted, thus creating a technological edge.

By embracing the second pathway, Fetcherr positions itself at the forefront of a new AI-driven market paradigm. This approach not only redefines market strategies and decision-making processes but also unlocks new opportunities for innovation and sustainable growth across various industries.

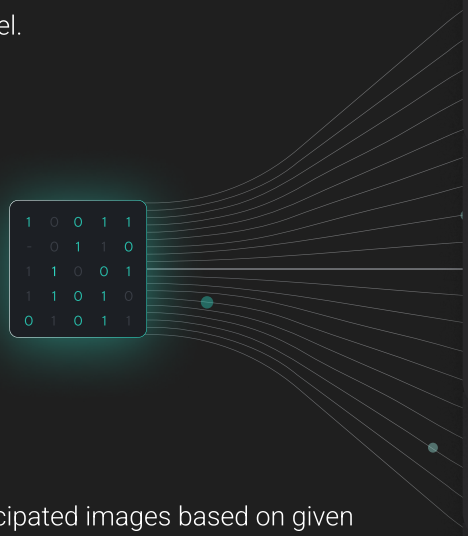
In the following sections, we will contrast Fetcherr's methodology with traditional industry strategies, explore the nuances of the LMM, and illustrate its dynamic influence on market behaviour. Our goal is to demonstrate how AI that surpasses human intelligence in non-natural data environments can revolutionize financial forecasting and provide businesses with a decisive competitive advantage.

# FETCHERR

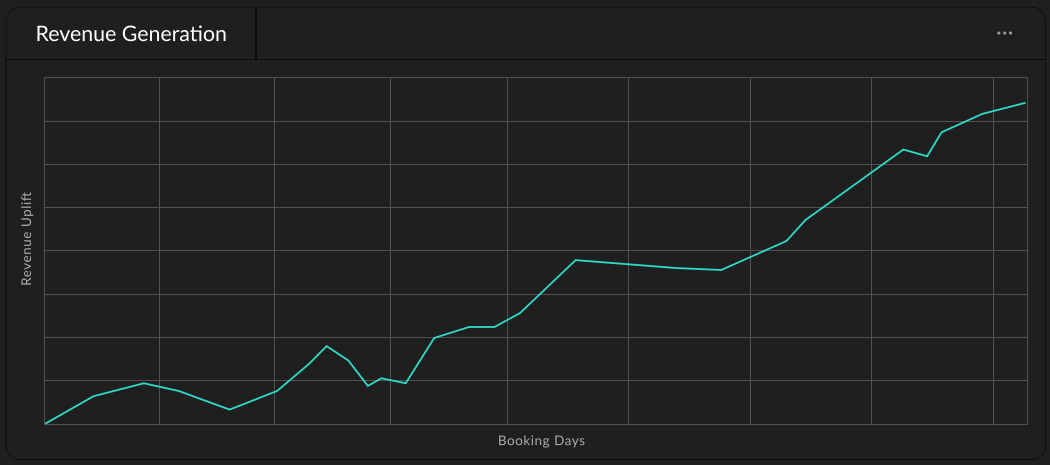
Fetcherr was formed by a team whose collective experience spans the major technological revolutions of recent decades. This team has successfully navigated significant shifts such as the rise of the internet and mobile technologies, and their respective impacts on commerce. They have also been at the forefront of the electrification of capital markets and the advancements in algorithmic and high-frequency trading (HFT). With this extensive background, the founders of Fetcherr recognized that their venture's success would depend not only on cutting-edge technology but also on the seamless integration of their product into existing business processes.

To achieve this, Fetcherr developed the Large Market Model.

## Large Market Model (LMM) – an innovative generative AI system designed to predict market dynamics.



This model is akin to how OpenAI's DALL-E generates anticipated images based on given descriptions. Similarly, the LMM optimizes decision-making processes for various market players. Although still in its early stages, the model has already begun to demonstrate its efficacy, outperforming traditional human-led approaches. Initial results indicate a promising future where Fetcherr's LMM could redefine market strategies and decision-making with its advanced predictive and optimization capabilities—sometimes described as "alien" in their sophistication.



# GENERATIVE AI

The evolution of Generative AI is rooted in advancements in deep learning technologies. Deep learning initially transformed artificial intelligence by enabling systems to learn and make decisions based on large datasets. This progression paved the way for Generative AI—a subset of AI focused on creating new content, ranging from text to images, based on learned patterns and data structures. The leap from merely interpreting and responding to data to generating new, coherent, and contextually relevant content marked a significant milestone in AI development.

Generative AI now encompasses a wide spectrum of content creation.

| | |
|---|---|
| **TEXT** | Sophisticated language models can produce everything from simple responses to complex narratives and technical writings. |
| **IMAGE** | AI can generate artwork, create realistic photos, and alter existing images with astonishing detail. |
| **VIDEO** | AI has made strides in creating realistic sequences and animations. |
| **VOICE** | Voice synthesis technologies produce lifelike speech increasingly difficult to distinguish from human voices. |

These advancements open up numerous possibilities across various sectors, including entertainment, education, marketing, and more.

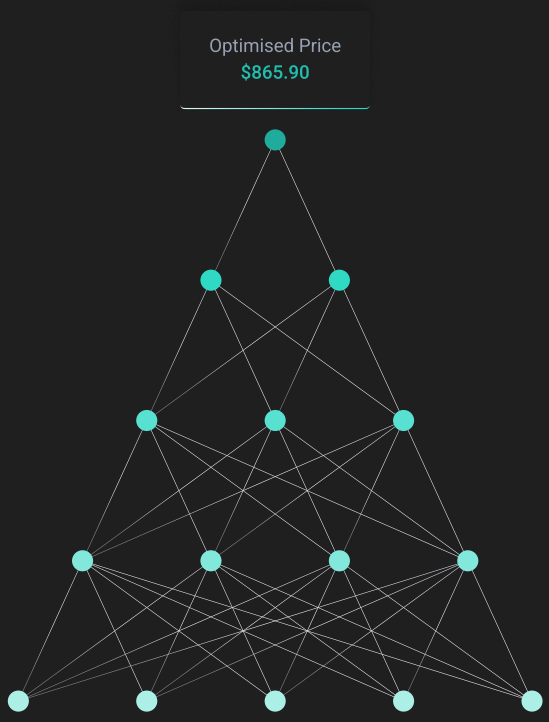
The business landscape for Generative AI features a mix of established tech giants and emerging startups. Companies like Google, Microsoft, and OpenAI are at the forefront, continuously pushing the boundaries of what AI can create. They have invested significantly in research and development, resulting in groundbreaking tools and applications. Alongside them are numerous startups, each specializing in specific aspects of Generative AI, from niche art generation to specialized text and video applications.

Fetcherr is a new entrant in this dynamic field, setting itself apart by focusing on generating market or business contexts. Unlike counterparts that create media or text, Fetcherr generates market insights and predictions and can even autonomously act upon them. This unique approach positions Fetcherr in a specialized segment of Generative AI that intersects with strategic financial and market analysis.

Fetcherr's AI delves into the complexities of market dynamics by:

- Employing advanced algorithms to forecast trends.
- Optimizing strategies based on data-driven insights previously unattainable.
- Swiftly leveraging these insights to achieve market and business impact.

This marks a significant departure from common applications of Generative AI and highlights the vast potential of AI in transforming the business world, particularly in market analysis and financial forecasting.



# INTELLIGENCE REVOLUTION

## Pathways to Surpass Human Intelligence

There are two distinct pathways for AI development to potentially surpass human intelligence, each based on different types of data and learning environments:

## 1.

### Training on Natural Human Data

(Text, Voice, Images, Video, Sound)

This method involves training AI models on large datasets composed of elements that humans naturally learn and process throughout their lives:

- **Language**: Text and Voice.
- **Visual Cues**: Images and Videos.
- **Auditory Signals**: Sounds.

Humans have evolved to excel in processing these types of data. Our brains are remarkably adept at:

- Understanding complex languages.
- Interpreting visual environments.
- Discerning sounds.

By feeding AI systems vast amounts of this natural data, the goal is to enable them to mimic – and eventually surpass – human capabilities in tasks like language translation, image recognition, and voice interaction. With enough data and advanced algorithms, AI could not only replicate human abilities in these areas but also exceed them, handling more data at faster speeds and with higher accuracy.

# 2.

## Training on Non-Natural, Human-Unadapted Data

(e.g., Financial Markets)

This pathway involves developing AI models that process and learn from data types and environments to which humans have not naturally adapted, such as:

- Financial and Business Markets.
- Complex Simulations.
- Large-Scale Logistic Systems.

Unlike language or visual processing, humans haven't evolved innate abilities to understand and predict complex, abstract systems like financial markets. Our proficiency in these areas stems from learned knowledge and analytical tools, not natural evolution.

Training AI on such non-natural data involves creating models that can:

- Understand complex systems.
- Predict behaviors within these systems.
- Operate efficiently within these environments.

By processing vast amounts of data more comprehensively and rapidly than humans, AI models could uncover insights and patterns beyond human cognitive capabilities.

This could lead to superior performance in tasks like:

- Market Predictions.
- Advanced Scientific Modeling.
- Optimizing Large-Scale Systems.

In summary, the **first approach** seeks to surpass human intelligence in areas where we naturally excel by amplifying and extending our inherent capabilities.

The **second approach** aims to go beyond human cognitive limits by tackling complex systems and data environments that are not part of our natural evolutionary learning process. Both approaches represent different but complementary pathways toward achieving advanced AI capabilities.

# ALGORITHMIC SHIFT

## The Transition from Traditional Trading to High-Frequency and Algorithmic Methods

A historical example illustrating the innovative approach of building AI systems targeted toward non-natural environments is the development and evolution of algorithmic trading in financial markets.

### EARLY FINANCIAL MARKETS:

- **Pre-1970s**:
  Financial markets operated without sophisticated technological interventions.
- **Manual Trades**:
  Trades were executed manually.
- **Human Analysis**:
  Market analysis relied on fundamental and basic technical analysis by human traders.
- **Natural Abilities**:
  Decision-making was based on natural human abilities and reasoning.

### INTRODUCTION OF COMPUTERS:

- **1970s and 1980s**:
  The introduction of computers into financial markets marked a significant shift.
- **Early Algorithmic Trading**:
  Emerged for basic tasks like automated calculation of stock prices or executing trades at predetermined times.
- **Leveraging Technology**:
  Began leveraging technology to operate in the complex, non-natural environment of the stock market.

**ADVANCEMENT OF ALGORITHMS:**

- **Increased Computing Power**:
  Allowed financial institutions to develop more complex algorithms.
- **Capabilities**:
  - Analyse large datasets.
  - Identify patterns.
  - Execute trades at speeds and volumes impossible for humans.

This shift parallels the idea of moving AI development from natural data processing (like image recognition) to specialized, non-natural environments (like financial markets).

**HIGH-FREQUENCY TRADING (HFT) AND AI INTEGRATION:**

- **Culmination of Evolution**:
  The advent of HFT and the integration of AI and machine learning represent the culmination of this evolution.
- **Modern Trading Algorithms**:
  - Analyze vast arrays of market data.
  - Make predictions.
  - Execute trades in milliseconds.
- **Digital, Data-Driven Environment**:
  AI systems are designed to thrive in environments fundamentally different from natural human environments.

**IMPACT ON THE FINANCIAL INDUSTRY:**

This innovative shift from human-centric trading strategies to AI-driven systems optimized for the non-natural environment of financial markets has had a transformative effect:

- **New Opportunities**:
  Paved the way for new opportunities and advancements.
- **Industry Progression**:
  Allowed the financial industry to progress and undergo lasting change.
- **Shift to Algorithmic Trading**:
  The financial sector has significantly shifted toward algorithmic trading.

This historical example parallels the concept of developing AI systems tailored to specialized domains rather than just replicating human-evolved abilities. It underscores the potential of AI to exceed human intelligence by mastering complex systems beyond our natural cognitive limits.

# FETCHERR'S LARGE MARKET MODEL

## LMM

To grasp how Fetcherr's Large Market Model (LMM) forecasts market trends, it's helpful to first consider more familiar generative AI models, such as those used for image generation.

These models undergo training with extensive databases of images, each tagged with descriptive labels. They become familiar with a vast array of visual elements – animals, human faces, landscapes – and learn to understand nuances like color gradients, edges, shades, and contours. This extensive exposure enables them to generate new images, even creating faces based on specific characteristics.


Similarly, Fetcherr's market models have been exposed to a wide array of market dynamics. They have internalized concepts like competition, pricing, demand elasticity, and the interplay between buyers and sellers.

This deep immersion in diverse market scenarios allows these models to make highly accurate and detailed predictions about future market behaviours. They can anticipate customer demand and its elasticity, as well as predict how market players might react, such as by adjusting prices or engaging in competitive strategies.

This level of understanding and predictive capability is rooted in the models' comprehensive analysis and comparison of numerous market instances, equipping them to foresee complex market dynamics with remarkable precision.

In the same vein as tech giants such as Google and OpenAI, who have invested years in developing robust data pipelines, infrastructure, and deep learning models for training and generating natural data, Fetcherr has embarked on a similar journey.

Fetcherr's focus, however, has been on compiling and utilizing data pipelines, infrastructure, and advanced deep learning models specifically tailored to analyze market data. Initially targeting the airline industry, Fetcherr's approach encompasses a comprehensive range of factors that influence market dynamics.

This includes variables like pricing, seat availability, current news, weather conditions, significant events, flight schedules, and even fluctuating oil prices, among others. By integrating these diverse data points, Fetcherr has built a nuanced and highly predictive model for the airline market, reflecting the same depth of data-driven insight as seen in the natural data models of their larger counterparts.

In the expansive field of machine learning, particularly in the creation of generative models, a diverse toolkit is employed, each component carefully chosen to suit specific requirements.

The following array of techniques is not exhaustive but is indicative of the tools available to professionals developing Generative AI models like the LMM:

| | |
|---|---|
| **Neural Networks**: | Central to generative AI are deep learning neural networks. These networks, comprising layers of artificial neurons, are adept at processing and learning from large datasets. |
| **Layer Diversity**: | This includes convolutional layers for spatial data and recurrent neural networks (RNNs) for sequential data processing. Attention mechanisms within these layers allow the model to focus selectively on pertinent parts of the input. |
| **Generative Model Architecture**: | Generative Adversarial Networks (GANs) and Autoencoders are key. GANs utilize dual-network structures for generating realistic images, while autoencoders are instrumental in data encoding and decoding, aiding in dimensionality reduction. |
| **Reinforcement Learning**: | Here, models evolve through trial and error, using feedback from their environment to refine decision-making. |
| **Network Enhancements**: | Bypasses and residual connections address issues like vanishing gradients in deep networks, ensuring effective learning throughout. |

| | |
|---|---|
| **Transfer Learning**: | Using pre-trained models for specific tasks reduces extensive training needs and data requirements. |
| **Optimization and Regularization**: | Optimization algorithms (like Adam, RMSprop) and regularization methods (such as dropout, batch normalization) are vital in model training. |
| **Transformers**: | As a standalone advancement, transformers represent a significant leap in model architecture. Unlike their specific application in NLP, transformers are valuable for their ability to efficiently process and interpret large sequences of data, making them versatile for various complex tasks. |
| **Proprietary Structures by Fetcherr**: | Fetcherr has developed proprietary structures that further enhance the capabilities of market generative models. These unique structures, tailored to Fetcherr's specific needs, represent a leap in custom AI solutions. They are designed to optimize complex tasks such as market analysis, providing a competitive edge in their application and efficacy in real-world scenarios. |

# FETCHERR'S DECISION-MAKING PIPELINE

While the Large Market Model (LMM) is a vital component, it alone does not suffice as a standalone tool for business decision-making. Instead, it forms a critical part of a more extensive pipeline that continuously integrates both historical and current data, striving to identify the most optimized decision for maximum business benefit.

This process involves:

- Numerous iterations of training the LMM, coupled with an exhaustive search for the ideal decision.
- Conducting this search within a simulated environment that feeds into a distinct reinforcement learning pipeline, specifically designed to refine and enhance the final decision-making process.

The high-level structure of this pipeline is illustrated in the diagram below, highlighting how the ultimate business action is the culmination of this comprehensive and iterative procedure.

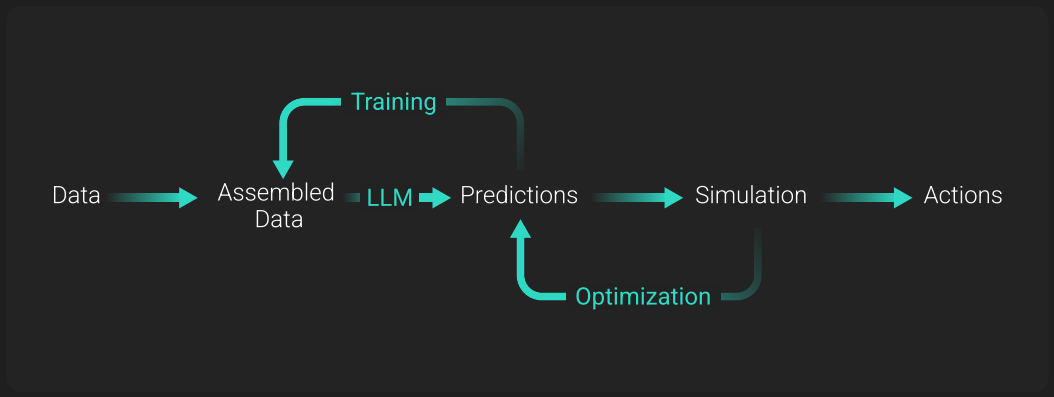



Illustration of the high level pipeline of the Fetcherr decision making system

# EXISTING & FUTURE APPLICATIONS

So far, Fetcherr has concentrated its efforts on incorporating travel and aviation-related data into its models.

This endeavour has involved collaborations with a diverse array of pioneering airlines:

Azul Linhas Aéreas Brasileiras — Brazil
virgin atlantic — UK
viva aerobus — Mexico
royal air maroc — Morocco
DELTA — USA
WESTJET — Canada

The primary focus of these partnerships has been to optimize key aspects such as pricing and inventory management for the airlines.

Looking ahead, Fetcherr plans to broaden the scope of its models. This expansion includes possibly venturing into new verticals such as: capital markets, hospitality, insurance, commerce, etc.

Additionally, the nature of the decisions made by the models will evolve. Beyond the current micro, trade-oriented decisions (such as pricing and inventory), Fetcherr aims to tackle additional challenges, including:

- Making supply chain decisions.
- Engaging in business-to-business (B2B) strategic decision-making.

By doing so, Fetcherr seeks to diversify the application and impact of its AI models, thereby enhancing its contribution to various industries.

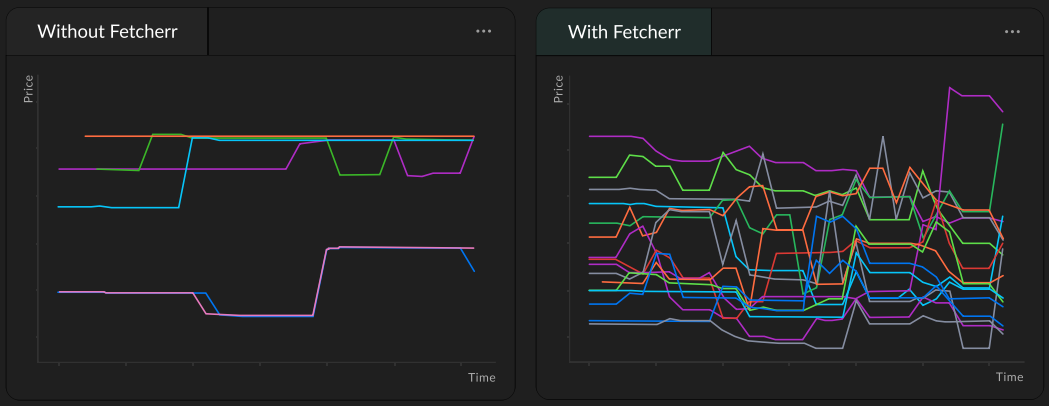
# RESULTS

## A New AI-Driven Market Dynamic Landscape

The implementation of advanced AI systems like the LMM has profoundly transformed competitive market landscapes. In this new paradigm, pricing strategies are increasingly dynamic and varied. As the LMM continuously gathers and analyzes market signals, prices adjust in real time, reflecting even the subtlest shifts in market conditions. These adjustments become more pronounced and frequent as the LMM cross-validates market signals, leading to more noticeable and rapid changes in pricing strategies.

Moreover, the correlation between these changes is diminished due to the enhanced granularity in decision-making that the AI offers, surpassing the limitations of human processing capabilities. Decisions are made with a level of precision and responsiveness previously unattainable, creating a market environment that is not only more attuned to external changes but also more proactive in setting new trends and standards against competitors.

The resulting market scenario bears a resemblance to the dynamics observed in capital markets, characterized by swift and informed responses to market signals. However, a distinct competitive edge will be bestowed upon businesses equipped with these AI capabilities. They will be at the forefront, leading the charge in this new era of market responsiveness and strategic proactivity, ultimately reshaping the way businesses compete and succeed.




This visual presents a side-by-side comparison of market dynamics for a group of airline tickets, both before and after the implementation of the Fetcherr system with one of its partner airlines.

The left side of the image depicts the pricing structure for various ticket types prior to the introduction of Fetcherr, while the right side illustrates the pricing post-implementation. Each line represents a different ticket category. In the pre-Fetcherr scenario (left), there is a notable overlap in the price levels of different tickets, resulting in minimal visible variation. On the right, the post-Fetcherr scenario shows a distinct change. The X-axis of the graph represents time, and the Y-axis indicates the price levels.

To maintain confidentiality as per the airline's secrecy requirements, specific numerical values have been omitted. However, it's important to note that all depicted values are derived from actual, live data.

# REVENUE UPLIFT

The system's outcome unfolds in two distinct phases to maximize market efficiency and revenue generation:

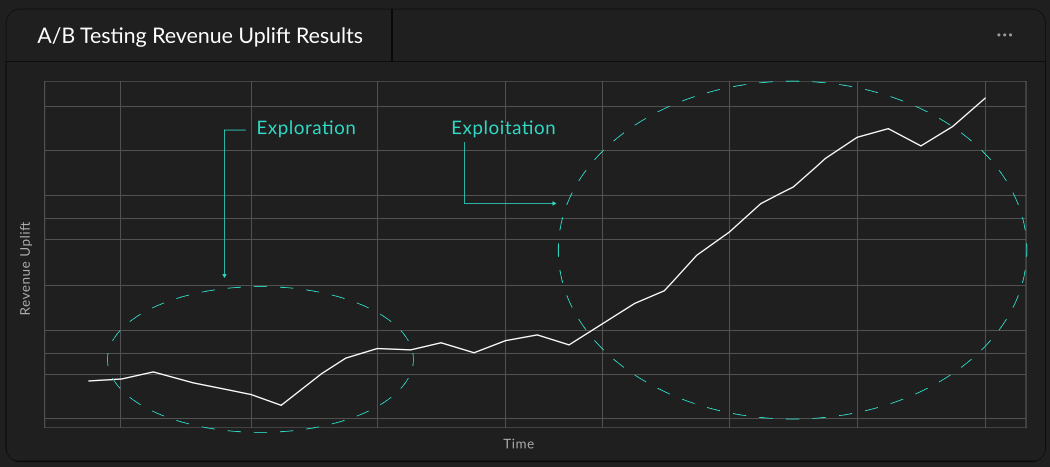
**Exploration Phase**

Initially, the system diligently senses and analyzes market dynamics. It learns from selected areas, gathers data, and understands market trends and customer.

**Exploitation Phase**

After comprehensive analysis, the system transitions into the exploitation phase. Here, the system's true potential is realized, as evidenced by a significant, double-digit revenue uplift for the business.

This progression from exploration to exploitation, and the resultant financial impact, is captured through rigorous A/B testing. The measurement methodology ensures a robust and reliable assessment of the system's performance, isolating its effects from other market variables.




The above plot represents the measured revenue uplift results. The X-axis represents time, tracking the system's operation from the exploration to the exploitation phase. The Y-axis denotes the revenue uplift percentage. It's important to note that, due to confidentiality agreements with our clients, actual numerical values are not displayed. However, the trend line clearly illustrates the significant uplift in revenue following the implementation of the Fetcherr system.

# CONCLUSION

## Becoming an AI-Centralized Business

In today's data-driven world, the need for advanced AI solutions is growing. As markets become more complex and unpredictable, companies need intelligent systems that can interpret large volumes of data, forecast shifts, and guide decisions with greater certainty. By placing AI at the center of their operations, businesses can respond more quickly, confidently, and effectively to evolving conditions.

Fetcherr embodies this vision by integrating AI with human expertise. Rather than replacing human judgment, Fetcherr's approach augments it – providing predictive insights, adaptive strategies, and tailored models to address specific challenges. This not only enhances day-to-day operations but also establishes a solid foundation for future innovation. As AI integration deepens, companies can deploy more sophisticated tools that incrementally increase value for both the organization and its customers.

Over time, this AI-centric framework drives continuous optimization of pricing, resource management, and customer engagement. These incremental gains, in turn, support larger strategic efforts, such as informed investments and long-term positioning, ensuring sustained competitiveness. Central to this process is transparency – AI must illuminate the data and logic behind each recommendation. By doing so, businesses comply with regulatory standards, earn stakeholder trust, and ensure that technological progress aligns with their core values.

This approach transcends industry boundaries. Whether in finance, manufacturing, aviation, or retail, any enterprise can leverage AI to discover hidden opportunities, adapt swiftly to market changes, and chart a strategic course for the future. As more organizations embrace this model, they will form a new wave of innovative, resilient businesses, ready to thrive in an era defined by complexity and rapid change. By uniting AI-driven capabilities with human insight, Fetcherr demonstrates how companies can achieve sustainable growth, sharpen their competitive edge and continually evolve in alignment with the marketplace.

## It’s time to elevate your enterprise with AI at the core of every strategic decision.

Contact Fetcherr to understand how our integrated, explainable, and compliant AI frameworks can help you anticipate market shifts, optimize resource allocation, and unlock long-term growth and resilience.

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