Inspiring Female Founders

Zehra Çataltepe, TAZI

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'What a long journey it's been,' Zehra Çataltepe sighed, sitting across from me as the English countryside whizzed by. It was clear that she was not referring to the train journey we shared from Oxford to London, nor the transatlantic flight to San Francisco that awaited her. These were just another leg in a life that had taken her from a rural Turkish town to the bustling streets of Ankara, and eventually to the heart of Silicon Valley as the co-founder of an AI start-up, TAZI. Each stop had been a stepping stone, a chapter in a story that defied expectations and embraced the unknown. From humble beginnings, she had navigated the complexities of academia, entrepreneurship, and motherhood, her path marked by resilience, determination, and an unwavering belief in the power of human connection in the age of technology.

The Beginning

With a nostalgic look in her eyes, Zehra smiled as she explained how her life had been shaped by the unwavering belief of her parents. Despite their modest means, they instilled in her a sense of limitless possibility. Her father, a carpenter, encouraged her to explore the world, teaching her the power of resilience and the importance of seizing opportunities. Her mother's curiosity and support continued to inspire her, even as Zehra pursued a career in technology. A pivotal moment came with the guidance of her high school physics teacher, who sparked her love for mathematics and encouraged her to pursue engineering. This passion led her to a scholarship at Bilkent University, where she received an exceptional education in computer science and engineering.

Eager to continue her studies in the US, she faced a setback when she was unable to secure a scholarship. Undeterred, she started a master's degree in Turkey and reapplied the following year. Finally, the doors swung open for a PhD at the prestigious California Institute of Technology, along with a research assistantship. To finance her journey from Turkey to California and cover initial expenses, she juggled her master's studies with a part-time job as a software engineer at a startup. Nights were spent working, days were filled with classes – a gruelling schedule, but a necessary sacrifice to fund her dreams.

During this time, she also met her now-husband through email conversations, where she and Tanju explored topics ranging from science to philosophy. After a long friendship,

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they married in March of 1993, during the first year of her PhD programme. With Tanju working in New Jersey and Zehra in California, they maintained a long-distance marriage – a challenge that tested their emotional resilience but also strengthened their relationship.

Entering the World of AI

As Caltech became her second home, Zehra delved into machine learning under the mentorship of renowned AI pioneer Yaser Abu-Mostafa. His passion was infectious, driving his PhD students to work relentlessly in pursuit of knowledge. Her doctoral research on learning from hints revolutionised her understanding of AI – not merely as a tool to process data, but as a system that could integrate human expertise to enhance learning.

'HINTS is really about AI systems learning from domain expertise', she explained. 'Because what happens is, if you have tons of data, you can teach an AI system. If you have really complicated patterns, then you have to push in more data and computational resources. But learning from hints allows the domain expert to massage the AI. AI learns a lot better if it can learn from data and the domain expert together.'

This realisation laid the foundation for her future work in human-AI collaboration, emphasising the importance of human intervention in building effective AI systems. After completing her PhD, she took a postdoctoral position at Bell Labs' Statistics Department in 1998. *'It was really a fusion of computer science and math. You needed both skills if you wanted to be successful in AI, and it was an incredible opportunity to work with brilliant minds.'* However, her research was soon interrupted by the arrival of their first child. After a fulfilling but exhausting maternity break, she started a part-time research job at a tech startup, which, unfortunately, could not survive the economic downturn following 9/11.

Determined to continue her career, Zehra embarked on an 11-month job search that finally led her to Siemens Corporate Research in New Jersey. There, she encountered another turning point in her AI journey. Working alongside mechanical engineers on power plant monitoring, she realised the transformative power of AI when placed in the hands of domain experts. By providing engineers with tools to interact directly with AI, she witnessed a fundamental shift: engineers who deeply understood the systems could guide the AI, refining its learning and dramatically improving its effectiveness. This collaborative approach led to a patented system that remained in use for years.

'We had mechanical engineers telling AI where it should learn from. The interface we built allowed them to train the AI. It wasn't just about good data points or bad data points – it was about enabling domain experts to shape the AI's learning process.'

Despite the intellectual stimulation at Siemens, a personal loss and a longing for family led Zehra and Tanju to make a bold decision: they would return to Turkey. This choice was met with surprise and concern from colleagues who wondered why they would leave behind promising careers in the US. But for Zehra and Tanju, the decision was about more than career ambitions – it was about finding a deeper sense of connection and purpose.

Founding TAZI

Starting with a single table in a shared office at Istanbul Technical University's Technopark, TAZI gradually grew into a team of data scientists and developers. In the early days, Zehra leveraged her standing as a top AI professor in Turkey to consult for the industry, bootstrapping the company's initial salaries. Their first clients came through existing connections in financial services and insurance, industries where AI's potential was immense but largely untapped. They approached these companies with a bold proposition: a new kind of AI that could evolve with the business.

Zehra and Tanju, Co-Founders of TAZI in 2023

From the beginning, Zehra and her team knew how critical it was to design their AI product to address human needs. They used their early relationships with a global insurance giant and a major credit collection company in Turkey to validate their approach and determine which characteristics were sources of competitive advantage for TAZI.

For instance, one of the most important differentiators the team decided to build was the ability of their AI to continuously learn. Zehra highlighted why this feature was crucial: '*Most AI solutions use batch learning, which means that when the characteristics of a problem change and new data is collected, the system appends the new data to the old and retrains a new model from scratch. Batch learning is inefficient – it may produce a completely different solution unrelated to the previous one and requires restarting the entire model creation lifecycle. In customer-facing environments where market conditions, competition, or even the product itself evolve constantly, batch learning becomes impractical. It is nearly impossible for midsize organisations without large data science teams to keep up. We addressed this issue by developing continuously learning machine learning models and complete solutions that update with every new data point.'*

Zehra recalled a pivotal moment when her team discovered the importance of explainability in AI adoption. *'We saw a huge disconnect between data scientists and business users. They were speaking different languages. One of our insurance customers*

told us, "We want to understand how these models work because I need to use them in my business. If I don't understand them, I cannot use them." That's when we started focusing on building explanation models.'

As a result, explainability became a core feature of the TAZI platform from the outset. The team designed the system to provide clear, accessible insights into the AI's decision-making process. This effort began with a continuously updated decision tree that made the model's behaviour transparent. Over time, TAZI further enhanced explainability by ensuring all data, model-related decisions, and dashboards were fully documented and accessible.

For organisations relying on automation, the continuously learning decision tree offered a significant advantage. '*Humans create rule-based systems to automate tasks, but these systems are incredibly difficult to maintain as conditions change. A continuously learning decision tree helps expand rules dynamically. When it encounters new data, it determines whether a rule is still relevant. If a rule is outdated, it cuts that branch. This solves one of the biggest challenges of rule-based systems – the maintenance of rules.'*

Zehra and Tanju also made several other key design decisions to refine TAZI's competitive advantage. One major choice was ensuring model robustness through the use of ensemble models[1]. Zehra explained how her past research guided this decision: '*We always used ensemble models because if one model fails, another one succeeds. This means customers always experience a functioning system since multiple models operate simultaneously.'*

Another important feature was intelligent feature selection[2]. From the very beginning, TAZI employed sophisticated algorithms to rapidly analyse data and identify the most relevant features for solving specific business problems.

Additionally, the team prioritised embedding business KPIs into AI performance measurements. This helped bridge the gap between data science and real-world business needs, ensuring that AI-driven insights were aligned with strategic business goals and could be seamlessly integrated into operations.

However, what truly set TAZI apart was the introduction of 'human-in-the-loop' functionality. Certain industries, such as banking and wealth management, were already data-savvy and eager to embrace AI. These companies, particularly those with customer-facing teams, needed AI tools that could respond to fast-changing market dynamics. Zehra described how this feature improved TAZI's adaptability: *'Our models continuously learn from new data, but there is always a delay before the model has seen enough data to make adjustments. Because our models are also explainable, users can identify emerging patterns – whether it's inflation, a competitor's move, or another external factor. If they recognise a trend that isn't just noise, they don't have to wait for more data. The human in the loop can intervene and modify the model immediately.'*

By empowering users to engage with and refine AI outputs, Zehra and her team introduced a new level of agility and responsiveness. This capability became a game-changer in dynamic markets, allowing businesses to adapt rapidly and stay ahead of the competition. '*Imagine being able to react 90% faster than your competitors. That kind of speed makes a huge difference – whether you're preventing fraud, responding to market shifts, or capturing new customers. Whoever moves first, if they have a solid foundation, will succeed.'*

Throughout the development process, Zehra and Tanju remained focused on scaling TAZI for the future. They knew that a bootstrapped startup couldn't afford to hire two new data scientists for every new client. *'The solution was automation,'* Zehra explained. *'Every process we performed as data scientists, we automated immediately. This way, we built scalability into our foundation.'*

Boutique Consultancy or Scalable Business?

As the team continued refining the product through countless conversations with clients, they encountered a strategic challenge: balancing customisation with scalability. Each client had unique needs, and implementing individual requests was becoming time-consuming for their development and data science teams. They reached a crossroads – would TAZI remain a boutique AI consultancy, or would it transform into a scalable AI business?

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[1] An ensemble model in machine learning is a technique that combines multiple machine learning models to improve the accuracy and reliability of predictions. The goal is to reduce the generalisation error of the prediction by using a diverse set of independent base models.

[2] Feature Selection is the method of reducing the input variable to an AI model by using only relevant data and getting rid of noise in data. It is the process of automatically choosing relevant features for the model based on the type of problem one is trying to solve.

Zehra and Tanju ultimately decided to pivot toward building a platform rather than a one-off solution. *'A platform company, especially in AI, serves multiple business units and solves various problems.'*

This platform approach allowed TAZI's solutions to be flexible and adaptable to each client's specific needs. Businesses could quickly adjust variables, update models, and respond to shifting conditions. However, this shift also introduced new challenges – developing and maintaining a platform required significant resources and expertise across multiple industries. The team had to decide whether to create AI solutions for all industries or to focus on a few select verticals where they could make the most impact.

'At some point, you have to accept reality. We didn't have the resources to serve all industries. Given our existing work with companies, and knowing that finance and insurance are data-intensive industries with numerous complex challenges, we decided to focus there.'

By narrowing their focus, they deepened their expertise in solving specific business problems in finance and insurance. They moved beyond simple churn prediction, developing AI solutions for customer retention, targeted marketing, and profitable growth strategies. A critical aspect of their success in these industries was the explainability of their models.

'Customers really loved the fact that they could see which data points the models were using, how segments were classified – whether it was high-risk customers or those unlikely to pay – and essentially "see" how AI was thinking. This transparency helped them trust AI when they saw familiar patterns, and it helped them adopt AI when they discovered customer segments they hadn't considered before.'

The introduction of generative AI marked another significant turning point for TAZI, expanding its capabilities even further. The platform began leveraging generative AI to process unstructured data, such as customer feedback and communications, creating a more comprehensive understanding of customer behaviour. This innovation enabled businesses to predict customer dissatisfaction and churn earlier than ever before, giving them a crucial competitive advantage.

'Before a customer churns, they often leave subtle signals – low Net Promoter Scores, complaints, reduced engagement. Our solution enables businesses to listen to their customers through app usage, website interactions, and other digital footprints. By consolidating these insights, our customers can predict not just churn, but early signs of dissatisfaction – long before their competitors do. This gives them time to take action and strengthen customer relationships.'

By continually integrating these insights, TAZI ensured that every new client experienced the same realisation – an immediate spark of understanding followed by enthusiasm for what the AI could do. As users saw firsthand how intuitive, powerful, and adaptable the platform was, they began envisioning endless possibilities for applying AI within their organisations. *'It's like opening a door to a world of possibilities with AI,'* Zehra reflected.

Moving to the US and Seeking Investment

While product development was progressing steadily, Zehra and Tanju realised that it was time to take TAZI to the international stage. Their initial plan was to keep the company headquartered in Turkey while expanding sales into Europe and the United States. However, they soon discovered that this approach was overly optimistic.

'Initially, we thought we could grow in both Europe and the US while staying in Turkey. We attended meetings and conferences, but it became clear that being physically present was essential. We tried to expand in Europe but failed. Growth is very difficult unless you have a strong local presence.'

Taking TAZI abroad required a major strategic decision: where to expand first. The US market stood out as *'not only significantly larger but also far more dynamic'* than those in Turkey and Europe. However, this decision came with personal and logistical challenges. Would Zehra and her family relocate entirely? The move would not only be a radical change for them personally but would also create physical distance between Zehra and the development team in Turkey. Ultimately, they decided on a hybrid solution – Zehra would commute between San Francisco and Istanbul, enduring a gruelling 13-hour flight. This setup allowed the company to maintain strong ties to its development roots while enabling Zehra to spearhead customer implementation efforts in the US.

By 2017, just two years after its founding in Turkey, TAZI established its US entity, marking the company's first step into the American market. Zehra and Tanju participated in informative meetings with experienced investors and entrepreneurs in the region, gaining valuable insights into scaling a business in Silicon Valley. However, it wasn't until 2020 that they actively launched operations in the US. One of the critical enablers of this transition was the first investment they secured in 2018 from a Turkish-European investor, providing the necessary financial backing to navigate this expansion.

When discussing funding, Zehra admits that she was initially resistant to seeking investment. *'I was doing my consultancy. Why should I give 20% of my company*

to you?' she had thought. However, she soon realised that scaling TAZI required far more capital than she could generate through consulting alone. *'Bringing a company into the US from abroad is very costly,'* she reflected. '*It's not really about the founders having a place to stay. It's about hiring new people who will help you grow your company in the United States and also securing a place and trust in the market. And Silicon Valley is extremely expensive.'*

Looking back, Zehra acknowledges that securing investors earlier in TAZI's lifecycle would have been beneficial. *'I first thought that investors would just give us money. Now I know that investors also bring partnerships, customers, other entrepreneurs, and other investors. They help you grow your company. Diffusion Capital Partners helped us make difficult decisions because they had seen other companies go through similar challenges before. If you want to grow your company, you should get investment as soon as possible, not later. We wouldn't have lost two years if we had gotten an investment earlier.*'

This decision to seek investment and establish a US presence proved pivotal in positioning TAZI for long-term success. While the road was challenging, it reinforced the importance of adaptability, strategic partnerships, and making bold decisions at the right time.

Fundraising at the Lion's Den

TAZI's journey in Silicon Valley truly took off when they joined the Alchemist Accelerator. This was followed by investments from prominent Silicon Valley firms, including Illuminate, Foothill, Handshake Ventures, and a network of angel investors. Reflecting on the impact of the accelerator, Zehra noted, '*Alchemist Accelerator was our home in Silicon Valley. Because of Alchemist, we became a Silicon Valley company.'* Beyond mentorship, she found that accelerators played a crucial role in securing investor introductions. *'An accelerator gets you investors as well. It becomes a very important warm introduction point for you.'* She also discovered that not all investments were created equal. *'An investor who gives you $1 million and has a network is much better than an investor who gives you $5 million and doesn't have a network.'*

The fundraising process in Silicon Valley was both thrilling and challenging. Zehra quickly realised that the key to a successful pitch lay in strong metrics. *'One of the things I found out is that if your company has good metrics, it's so much easier to pitch.'* She emphasised the importance of predictive indicators, adding, *'Even if you don't have good metrics, have some predictive indicators. If you don't have the number of customers in your pipeline, have metrics on your pipeline generation, for example, so that people believe you have a mechanism that's going to scale.'* Among all metrics, she found customer retention to be one of the most critical. *'I found churn, customer churn, to be a very important metric. Even if you are an early-stage company, people want to see that – like, people buy your product and they are happy with your product.'*

As she navigated the investor landscape, Zehra also learned how to manage different types of investors. *'The worst thing is when you pitch to a room of investors that have deep technical expertise and no technical expertise at the same time. When that happens, you should really control the meeting. You should decide what you want to pitch.'* She found that technical details could often be a distraction. *'People are not really that interested in how AI works. They are interested in whether your AI actually works, whether it's better than the competition, and whether it has a differentiator that translates into business advantage.'* Similarly, she learned that product demonstrations had to be concise and impactful. *'Demos don't mean much. I found out that showing one screen that proves you have a product is enough. Investors don't want a 10-minute demo; you are wasting their time. But if you have an easily expressible differentiator, you should express that.'*

TAZI receiving the Best of Show Award at Finovate Europe 2023.

Beyond pitching and networking, Zehra came to understand the importance of legal negotiations in securing funding. *'Do not give up your board seats. Negotiate like hell on the term sheet.'* She also stressed the necessity of legal expertise to protect founders from unfavourable terms. *'Most founders don't know how to read term sheets. I didn't know how to read term sheets. So, have a great lawyer. And lawyers take a lot of money, so make sure you budget for that.'*

Zehra also encountered gender biases throughout her fundraising journey. Some investors made her acutely aware of the challenges female founders face. '*Your chance of finding investment as a female founder is one in 100 compared to male founders,' a US investor told her. 'I looked him in the eye and countered him with my own reality,'* Zehra recalls. *'The probability of a woman from a remote Turkish town earning a PhD from Caltech, landing in Silicon Valley, and founding an AI company is practically zero. Yet, here I am.'*

Over time, Zehra realised that this adversity had strengthened her. Women in entrepreneurship had learned to be resourceful, creating their own narratives and challenging the status quo. *'As a woman, we tend to undersell ourselves. We are just too modest. And as a Turkish woman, our culture teaches us to be modest. Not only for women but also for men – being modest is supposed to be a virtue.'* However, in Silicon Valley, self-promotion was an essential skill. *'Silicon Valley is full of people who, excuse my language, can BS really well. They don't have a product, they just have an idea, and they can sell that idea. So, you have to be a good salesperson.'*

Over time, Zehra refined her approach, shifting her mindset from seeking approval to asserting confidence in investor meetings. *'Your attitude should not be, "Oh, investor, please give me money." It should be, "You are so lucky that I am accepting you as my investor. This is a great company, and I am really trying to determine if you are a good partner or not."'*

In her journey to cultivate confidence, she focused on her core strengths: building genuine connections, using empathy to understand her clients' needs, and earning respect through her expertise. *'As an AI expert and university professor, I've taught machine learning for over 30 years. Hundreds, if not thousands, of people learned AI from me. My expertise gave me credibility. Expertise trumps everything. But to become an expert, you have to work very hard. Women often work twice as hard as their male counterparts actually. But once you're recognized as an expert, gender matters less.'*

Despite the many ways she had fought through Silicon Valley's male-dominated investor and customer world, Zehra admitted that certain aspects of business culture still posed challenges. *'It's the wining and dining. Someone once told me that insurance and financial companies build relationships over drinks. That's not something I feel comfortable with. So instead, I focus on being a trusted advisor and friend, having meaningful conversations when we're both at full mental capacity,'* she said with a smile.

As the train slowed into London, Zehra offered a final reflection on fundraising. *'It's a marathon, not a sprint. You'll pitch to hundreds of investors. It takes serious time and effort. One mistake we made was slowing our growth because fundraising consumed so much of the team's energy. Structure it so only some people are focused on it – others need to keep the business moving.'*

A Look into the Future

When we stepped off the train at Paddington, I was convinced that Zehra's story wasn't just about building a company – it was about persistence, conviction, and navigating uncertainty with purpose. For years, she had balanced a life stretched across continents, commuting between countries and time zones, because she believed in the problem she was solving. As she disappeared into the crowd toward the Heathrow Express, her parting words stayed with me: *'Your dreams can only be as big as the people you inspire to run with you.'* Zehra certainly inspired us at Oxford plenty to share her story.

Zehra accepting the Woman Entrepreneur in Technology of the Year Award at the 8th Istanbul Economy Summit in December 2024

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