AI Case Study

**Introduction**

From healthcare to media, fitness/nutrition, science, and finance, there has been a palpable shift in recent years from a default deference to credentialed expertise. Today, people are increasingly persuaded “n=1” experiments, where personal experience and experimentation are increasingly ruling the day.

In the area of personal finance and investing, this growing suspicion of “the science” and “the experts” has been reflected in the exponential growth of index and target-date investing. Many investors are content to sacrifice the potential for massive upside gains for the safety of market returns, especially when the market has been consistently returning high-single digit and double digit returns.

It’s logical: why pay an advisor to actively manage a retirement or a savings portfolio when all of the research tells us that active portfolio management (writ large) lags simple indexing strategies.

However, indexing is only one part of the equation. How to build, manage, and maintain a portfolio of investments to serve a specific purpose (retirement, savings, estate planning) cannot be addressed by mere indexing alone. At some point, strategic concerns must be addressed.

Here is where “robo-advisors” enter into the picture.

With the rise and ongoing development of AI technology, automated portfolio management and strategy software has become increasingly sophisticated. After all, the vast majority of investors do not have unique needs, or funky risk profiles, or complicated estate planning issues that require complicated planning and management.

For these investors, sophisticated AI-driven software, commonly known as “robo-advisors” can provide investment and elemental strategic advice based on an individual’s needs at greatly reduced cost and increased convenience.

For better or worse, robo-advisors allow investors to keep a stronger hold over their investment strategy and portfolio management.

**Market Opportunity**

According to Grand View Research (<https://www.grandviewresearch.com/industry-analysis/robo-advisory-market-report>), robo-advising was a $6.61B market in 2023. The firm forecasts 30% compound annual growth rate (CAGR), and they anticipate a total market of more than $40B by 2030.

They note:

*The global financial sector has experienced rapid growth due to the rising utilization of digital technology. The integration of Artificial Intelligence (AI) into investment procedures has facilitated automated investing. Retail investors are embracing robo advisors because of their ease of access and cost-effectiveness. Generation x and Millennial generations have not been well catered to by wealth managers due to the high fees they charge and require a high minimum balance. With the robo advisors, retail investors have access to the same services at a lower cost, which is driving the growth of the market.*

There are dozens of robo-advisor applications on the market today. Many of them are used by the large household names in asset management (Charles Schwab immediately comes to mind). But many were the result of innovative entrepreneurship.

Acorns is one such company.

## Overview and Origin

\* Name of company:   
**Acorns**

\* When was the company incorporated?  
**2012**

\* Who are the founders of the company?   
**Walter Wemple Cruttenden III and Jeffrey James Cruttenden**

\* How did the idea for the company (or project) come about?  
**Founder Jeffrey Cruttenden first identified the market opportunity as entrepreneurs do: by perceiving difficulties encountered by the people in his life around a common problem: many of his college friends understood the importance of investing, but were discouraged by high fees, high minimums, and a lack of attention by advisors who were disinterested in working with small accounts.**

**(**[**http://cruttendenpartners.com/index#/acorns/**](http://cruttendenpartners.com/index#/acorns/)**)**

\* How is the company funded? How much funding have they received?  
**Acorns was initially funded by an investment of the Cruttenden family office. The company is privately held, and has received investments from prominent individuals, venture capitalists, and large corporations. According to the most recently available data (2019), the firm has received $100M in funding.**

## Business Activities

\* What specific problem is the company or project trying to solve?  
**Acorns is designed to address several barriers to investing: high fees, high minimums, and poor service. Using an investing concept known as “micro-investing,” Acorns enables its users to invest small amounts from a diversified number of accounts in order to make consistent investments that do not burden the account holder. The amounts that canm be invested seem almost incidental, but have the power to impressively seed investment accounts over time.**

\* Who is the company's intended customer? Is there any information about the market size of this set of customers?  
**By definition, micro-investing means that the total amounts invested are small, so it is not a service designed for people with shorter investment time horizons. The key demographic are Millennials, Gen Z, young professionals, novice investors, and even financial advisors working with these demographics.**

**Importantly, the Acorn service is also marketed as a way to help parents to establish good habits for their younger children, so the service has a product (Acorns Early) specifically designed for children (with their parents acting as account owners).**

\* What solution does this company offer that their competitors do not or cannot offer? (What is the unfair advantage they utilize?)  
**Acorns has a “spare change” function that enables its users to connect their account to a credit card or bank debit account. When purchases are made, the amounts are rounded up to the nearest dollar, and Acorn accepts deposits in the amount of these “Round-Ups.”**

\* Which technologies are they currently using, and how are they implementing them? (This may take a little bit of sleuthing & you may want to search the company’s engineering blog or use sites like **Stackshare to find this information.)  
JavaScript, React, PostgreSQL, Redis, Bootstrap, Amazon S3, Amazon EC2, Ruby, Android SDK, Amazon CloudFront, Swift, Rails, Kotlin, Scala, Apache Spark, D3.js, Polymer, GitHub, Docker, Sublime Text, Vim, Travis CI, New Relic, Grafana, Amazon EC2 Container Service, Amazon CloudWatch**

(https://stackshare.io/acorns/acorns\_)

## Landscape

\* What field is the company in?  
**Acorns is an app-based robo-advisor investment platform.**

\* What have been the major trends and innovations of this field over the last 5-10 years?  
**Many of the trends, writ large, mirror those of the broader industry that seeks to grow a core retail client base: more personalization, greater customization and convenience, lower costs, and integrated, diversified product offerings (e.g.: investing + online banking).**

**From a technology perspective, some of the key innovations include leveraging technology innovations to improve the speed and quality of onboarding, financial planning, and portfolio management; increased mobility and security; and enabling the implementation of ever-increasing sophisticated portfolio management and investing strategies (ESG/SRI, tax loss harvesting, portfolio rebalancing, tax efficient portfolios).**

(https://papers.ssrn.com/sol3/papers.cfm?abstract\_id=3776826)

\* What are the other major companies in this field?  
**Aside from the robo-advisors offered by the large, name-brand investment management firms, such as Vanguard and Charles Schwab, Acorns has a number of competitors hat target the same demographics, albeit with differentiated technologies and approaches:**

**Robinhood, Stash, Betterment, Wealthfront, Qapital, SoFi, M1 Finance, Varo Money, Traditional investment managers and banks.**

(https://businessmodelanalyst.com/acorns-business-model/)

## Results

\* What has been the business impact of this company so far?  
**Acorns has effectively disrupted certain aspects of the retail investment management industry. With its eager embrace of what might be called “downmarket” clients, Acorns’ “Round-Ups” microinvesting strategy has mitigated a significant barrier to entry for millions of investors: high fees, high minimums, and poor customer service. Capitalizing on the increasing understanding that “experts” are often not as effective as they should be, given the costs and inconveniences with which they often saddle investors, Acorns has essentially removed the barrier to entry to the investment industry.**

\* What are some of the core metrics that companies in this field use to measure success? How is your company performing based on these metrics?  
**As with the rest of the traditional investment management industry, the success of a product, in and of itself, is client growth, assets under management (this is a function of both sales success AND investment success), and client turnover (how many clients come and go over the course of time – a measure of satisfaction).**

**More broadly, the company has to make money, obviously. For companies trolling downmarket (like Acorns), offering products and services at low or no cost, this can be a challenge, as their revenue is thus derived solely from account management and/or subscription fees. Because these fees are typically a percentage of assets under management, low account balances mean that each individual account will not generate much in fee revenue, so this has to be made up by volume (and subscriptions).**

\* How is your company performing relative to competitors in the same field?

**Between 2014 and 2023, Acorns’ users growth has averaged 72% annually, from 49,800 to 6.58M. Assets under management growth has been even more impressive, with annualized growth of 122% ($4.8M to $6.3B).**

**Recent revenue figures are not available, as Acorns is a privately held company. However, they flirted with going public via a SPAC in 2022, and released some revenue figures, all of which showed negative operating income (-$109M in 2019 and -$65M in 2020. Anticipated losses in 2021 were forecast to be -$85M, -$82M in 2022, and -$35M in 2023).**

**It is difficult o make apples-to-apples comparisons, as many of Acorns’ competitors are also privately-held. SoFi, one of the publicly-traded competitors, is profitable, but their business strategy is much more diversified than Acorns’.**

(https://investingintheweb.com/brokers/acorn-statistics/#ibkr-glance)

## Recommendations

\* If you were to advise the company, what products or services would you suggest they offer? (This could be something that a competitor offers, or use your imagination!)  
**Because Acorns lives in the downmarket part of the investment management industry, absent a new strategy or change in focus, they need to continue growing their consumer base and assets under management while simultaneously keeping a lid on costs.**

**Deviating from one’s core strategy invites some risk, as it requires additional capital expenditure and increased overhead costs. Does Acorns want to be in the online banking business? Loan origination? It doesn’t seem so.**

**I would suggest using their existing market strengths to take a truly long-term view of its business. As existing clients’ balances grow, begin offering premium services that cater to their improved financial standing.**

**Acorns can employ AI-assisted technologies to identify their best clients; the ones who consistently invest, as well as consistently increase investment amounts. Because the firm is tied into credit card and banking accounts, it has the opportunity to leverage insights generated from that data to nurture and grow their relationships with their best clients.**

**In terms of a specific product, I might suggest an AI generated “Advisor” that clients can consult: a fully interactive, AI-generated “advisor” with a clever name (Rocky?”) with voice recognition, backed by a LLM that can answer the vast majority of the routine, yet vitally important, questions investors have.**

\* Why do you think that offering this product or service would benefit the company?  
**Keeping a customer is vastly cheaper than buying a new one. Building brand loyalty with their clients early, then continuing to offer new products and services that reflect their growing financial position is a reliable to ensure a high degree of client satisfaction. An on-demand, fully automated, deeply schooled AI advisor would be a highly-differentiated offering.**

\* What technologies would this additional product or service utilize?  
**Natural language processing, large language models (Transformer model)**

\* Why are these technologies appropriate for your solution?  
**NLP: because the interactions will originate with the client (either typed or spoken), the program will need to be able to translate that content into a form it recognized while also being able to discern meaning and provide usable responses to queries.**

**LLM (TM): LLMs have the size and scale to handle (and be trained on) the incredible amount of financial data, permutations of question syntax (i.e.: asking the same question different ways), and internal company qualitative and quantitative data it would need. LLMs also employ the neural networks and deep learning architectures (like transformers) needed to process the data effectively.**