Apple – An Opportunity to be More Open

Provide More Value Creation for Everyone Using AI

For Distribution to **Tim Cook & Apple Strategic Board**

Drafted for Consideration by **Manish Sainani**,
General Partner Hushh Renaissance AI First Fund A

On behalf of **Hushh Technologies LPs** and **institutional shareholders of Apple, Inc.**

🤫 **Confidential** 🤐

[Date: Jun 13, 2025]

Table of Contents

PART I

Empowering Apple's AI Ecosystem Through Open-Source: A Proposal

1.0 Introduction

Apple has built an enviable foundation in artificial intelligence – from the specialized Apple Neural Engine (ANE) in every modern iPhone and Mac, to robust on-device AI frameworks like Core ML. Despite this, Apple's AI platform remains relatively closed, potentially limiting developer adoption. In the era of generative AI and large language models (LLMs), capturing developer mindshare is crucial.

This report makes the case that Apple should embrace an unprecedented level of openness in its AI strategy – open-sourcing key AI infrastructure, APIs, and tools – to galvanize the developer community and lock in a long-term advantage for the iOS/macOS ecosystem. By doing so, Apple can leverage its privacy-first, on-device AI strengths to stand out against competitors like Nvidia, Google, and Meta, ultimately driving 100× value growth in its ecosystem for users, developers, and shareholders alike.

Apple's M3 Ultra system-on-chip – a testament to Apple's cutting-edge AI hardware. The M3 Ultra features a 32-core Neural Engine (double the previous generation's cores) and support for up to 512GB of unified memory, enabling on-device deployment of AI models with hundreds of billions of parameters. Apple's silicon advancements underscore the company's potential to compete in AI by leveraging high-performance, energy-efficient hardware already shipped in millions of devices.

2.0 Apple's AI Infrastructure Today

Apple has quietly assembled impressive AI infrastructure that spans custom silicon, software frameworks, and on-device services:

2.1 Apple Neural Engine (ANE) and Silicon

Every A-series chip since 2017 (starting with A11 Bionic) includes Apple's Neural Engine, a dedicated NPU for machine learning tasks. Over five generations, the 16-core ANE's peak

throughput grew 26× – from 0.6 TFlops in the iPhone X to ~15.8 TFlops in the A15 chip. Today, all M-series Mac chips also feature the ANE, scaling Apple's AI hardware from phones to desktops.

Apple's newest M3 Ultra doubles the Neural Engine cores to 32 and boasts 800GB/s memory bandwidth, so powerful that Apple claims a Mac Studio can run LLMs with 600 billion parameters entirely on-device. This vertically integrated hardware (CPU, GPU, Neural Engine, unified memory) gives Apple an edge-compute powerhouse distributed across 2+ billion active devices – a latent AI network that only needs the right software support to unlock its potential.

2.2 Core ML and On-Device Frameworks

On the software side, Apple's Core ML framework allows developers to run ML models on-device with ease. Core ML automatically orchestrates computations across CPU, GPU, and ANE to optimize performance and energy use. For example, a Core ML model can seamlessly execute partly on the Neural Engine and partly on GPU if needed, without the developer explicitly managing hardware details. Apple provides tools like coremltools (open-sourced on GitHub) to convert models from PyTorch or TensorFlow into Core ML format. Thanks to such tools, developers can already integrate features like image recognition, natural language, or even transformer models into iOS apps entirely on-device, preserving user privacy. Apple's commitment to on-device AI is so strong that its latest "Apple Intelligence" features (e.g. image generation, advanced personal assistant functions) run locally on the device rather than in the cloud – albeit only on the latest, most powerful hardware in initial release. This on-device approach ensures user data never leaves the device, aligning with Apple's privacy-first ethos. As Clem Delangue (CEO of Hugging Face) lauded, "Core ML models run strictly on the user's device…, keeping apps lightning-fast and ensuring user data remains private."

2.3 Emerging Apple ML Tools (MLX)

In late 2023, Apple took an unexpected step toward openness by releasing MLX, a machine learning framework optimized for Apple Silicon, under the MIT open-source license.

MLX is essentially a NumPy/PyTorch-like array library designed for efficient training and inference on Macs and iDevices. Implemented in Python and C++, it lets researchers

fine-tune LLMs, generate images, or run speech recognition directly on Apple hardware. Notably, MLX leverages Apple's unified memory – arrays live in shared memory accessible by both CPU and GPU without costly copies. This means models can utilize the full RAM and unified memory bandwidth of M1/M2 chips (up to unified unified memory), a capability workstation GPUs often lack.

Apple explicitly states MLX is "by ML researchers for ML researchers," inviting the community to extend and improve it. Early examples in the MLX repo demonstrate fine-tuning Llama 2, generating images with Stable Diffusion, and running Whisper speech recognition on Apple devices. This move indicates Apple's recognition that open-source collaboration can turbocharge its platform. Indeed, within months Apple partnered with Hugging Face to create an MLX Community hub hosting pre-converted model weights for Apple Silicon. This community already counts thousands of developers and enthusiasts sharing optimizations for running popular models (Mistral, LLaMA, Stable Diffusion, etc.) on iPhones and Macs. In other words, Apple has planted seeds of an open-source Apple ML ecosystem – and the developer interest is clearly there.

2.4 iCloud and AI Services

While most of Apple's AI focus is on-device, Apple also introduced Private Cloud Compute for cases where cloud is used without compromising privacy. As part of Apple's "hybrid" approach, sensitive tasks (like personalized ML) run on ANE locally, whereas larger-scale processing may use Apple's cloud with end-to-end encryption and anonymization. Looking forward, Apple could offer developer-facing AI cloud services (perhaps akin to AWS or Google Cloud's AI APIs) tightly integrated with iOS. However, to truly win developers, any such services should embrace open models and interfaces, not proprietary lock-in. Open-sourcing client libraries or even model implementations used in iCloud services would signal to developers that Apple is "the new Apple of the AI era", ready to shed its historically closed nature in favor of community and transparency.

3.0 Why Apple Should Embrace Open Source for AI

3.1 Winning Developer Mindshare (and Lock-In)

In the AI gold rush, the biggest asset isn't algorithms or even data – it's developers. The platforms that developers flock to will create the best apps, attract the most users, and set

industry standards. Apple understands this from the App Store era, but the dynamics in AI are different: developers gravitate toward open, flexible tools and large collaborative ecosystems (think Python, PyTorch, TensorFlow) rather than closed, single-vendor stacks. If Apple wants the AI developer community to center on its devices and APIs, it must lower barriers and present itself as developer-friendly and open.

Open-sourcing key aspects of Apple's AI infrastructure would significantly increase developer adoption by providing transparency and extensibility. For example, open-sourcing the iOS AI SDKs and APIs (such as Core ML's components or new Apple Intelligence APIs) would let developers not only trust Apple's implementations, but also contribute enhancements or tailor them to niche use cases. They would feel a greater ownership of the ecosystem. Apple's MLX library is a great precedent – by releasing a high-performance Apple Silicon ML toolkit on GitHub, Apple instantly tapped into the energy of external contributors and researchers. As one developer noted, frameworks like MLX demonstrate Apple Silicon's potential and are "very important to every platform" as LLMs and AI workloads explode in popularity. If Apple expands such efforts – for instance, officially hosting MLX on Apple's GitHub with long-term support – it sends a strong signal that "Apple ❤️ Open Source" for AI.

Crucially, embracing open source does not mean giving up Apple's platform lock-in. In fact, it can increase lock-in via mindshare: all the code can be open, but it's code optimized for Apple's hardware and OS. A developer who builds an amazing iOS app using Apple's open-source ML tools is still inherently tied into Apple's vertical ecosystem (since those tools run best on Apple chips and integrate with Xcode, iCloud, etc.). By open-sourcing the tools but keeping the integration tight, Apple gets the best of both worlds – the innovations of the global developer community accrue to Apple's platform, and developers become invested in Apple's success. This strategy has been used effectively by others: Meta open-sourced PyTorch, which became one of the most popular DL frameworks, ensuring Meta's influence in AI research while indirectly favoring its hardware initiatives; Google open-sourced TensorFlow early, which drove adoption of Google's AI services and TPU cloud offerings. Apple can do the same, but for the edge AI domain – seeding an ecosystem of open projects geared towards iPhone, iPad, and Mac.

Moreover, open source releases would combat any lingering skepticism about Apple's commitment. Historically, some in the developer community assume "Apple = closed." In fact,

Apple has a long track record of open-sourcing components (WebKit, LLVM, Swift, ResearchKit, etc.), but it doesn't always broadcast it. By high-profile open-sourcing – say, making parts of "Apple Intelligence" (the new generative AI features) open to developers – Apple can dramatically shift perceptions.

> This change in marketing and messaging ("the new, open Apple in AI") could have a 100× amplification effect on goodwill.

Developers would be more inclined to experiment with Apple's AI APIs if they know they aren't black boxes. Investors and tech media would likely praise Apple for aligning with the modern AI culture of openness, possibly boosting Apple's brand value as a leader in AI that is both powerful and principled. As one Reddit user wryly observed, it's an unexpected timeline when "a company called OpenAI is closed-source and for-profit, but Apple is open-sourcing their AI" – yet that irony could play to Apple's advantage in public perception.

3.2 Accelerating Innovation via Community Collaboration

No single company, not even one as resource-rich as Apple, can single-handedly foresee and develop every breakthrough in AI. The open-source community, on the other hand, moves with astonishing speed and creativity – as seen in the explosion of projects around Stable Diffusion, LLaMA, and countless ML models. By making its AI infrastructure open, Apple can harness the collective innovation of thousands of researchers and developers. Improvements and new features would come not just from Apple's internal teams, but from outsiders eager to optimize AI on Apple devices.

We already see this effect in the nascent MLX community. After Apple open-sourced MLX, independent developers quickly added support for things like exporting fine-tuned models to common formats and running 4-bit quantized LLMs on Macs. Hugging Face's MLX Community org now hosts dozens of model variants fine-tuned or quantized for Apple hardware – work that Apple didn't have to do itself, but benefits its platform. Open collaboration can also surface bugs and performance issues that internal testing might miss. Through "many eyes," the software becomes more robust and performant. In essence, Apple can leverage open source as a form of crowdsourced R&D and QA for its AI stack.

Apple's recent partnership with Hugging Face underscores how collaboration fuels innovation. By uploading 20 new Core ML models and 4 datasets to Hugging Face in mid-2024, Apple invited the community to build upon and integrate these models. Clem Delangue noted this was a "major update" that signals Apple's commitment to advancing AI while "prioritizing user privacy and efficiency." The community can now take Apple-optimized models (for image classification, depth estimation, etc.) and improve or apply them in creative ways. This iterative loop – Apple provides a baseline model, developers remix and enhance it, Apple integrates the best ideas – creates a virtuous cycle of improvement. If Apple open-sourced even more of its AI tools (for example, the training code for those Core ML models, or the architecture of its on-device personal LLMs), it would supercharge this cycle. External contributions could help Apple keep pace with or even leapfrog the AI advances coming out of open communities centered on PyTorch and TensorFlow.

3.3 Differentiating with Privacy and On-Device AI

Privacy is a core Apple value, and open-sourcing on-device AI plays directly to that strength. In contrast to competitors who often rely on cloud processing (raising concerns over data security), Apple can champion a future where AI lives on the edge – on your phone or laptop, under your control. By being more open, Apple can rally developers around the idea that privacy-first AI is not only possible, but preferable. Open code can be audited to ensure it isn't phoning home or leaking data, reinforcing trust. As Wired put it, Apple is effectively "gambling on privacy as a killer feature" in AI. Making its AI frameworks open-source would back up this gamble with transparency. Developers and users could see that Apple's AI algorithms handle personal data only locally. This is a powerful differentiator: Google's latest AI features often run on cloud servers (or a mix of cloud and device), which means user data might transit off-device.

> Apple can say, "Our AI is open, and it never leaves your device." That combination is compelling for a public increasingly wary of how their data is used in AI services.

On-device AI is also key to performance and user experience. Processing data locally eliminates network latency, enabling real-time interaction (e.g. instant image effects, or language generation that works offline). Apple's Core ML models optimized for devices show

dramatically faster performance by avoiding round-trip to server. By pushing this narrative – "AI at the edge = fast and private" – Apple can position itself as the anti-cloud AI platform, which is very attractive for many applications. Open-sourcing the tools to implement edge AI makes it far easier for developers to adopt this approach. If Apple provides open reference implementations (like it did with an optimized ANE Transformer reference for PyTorch), developers can learn how to make their models run efficiently on devices. Apple's own engineers demonstrated a 10× speed and 14× memory improvement for a Transformer model on ANE with proper optimizations – knowledge they shared openly with the community. This equips every third-party developer to likewise optimize their apps for Apple's Neural Engine. The result is a rich selection of AI-powered apps on iOS and macOS that deliver great features without needing cloud backends. Users get innovative AI experiences with guaranteed privacy, and developers get to stand on Apple's shoulders (and silicon). That synergy will keep users and devs loyal to Apple's ecosystem.

Finally, regulatory trends suggest on-device AI will be advantageous. Data protection laws (GDPR and beyond) increasingly restrict sending personal data to remote servers for processing. If Apple provides an open, privacy-compliant AI SDK, enterprises and health developers, for instance, can build solutions that satisfy regulations by keeping data local. Competing platforms might struggle with this if their AI solutions require cloud connectivity. In the long term, as edge computing grows, Apple is poised to "win the market" by having the most mature on-device AI ecosystem – but only if it captures developers now. Openness is the catalyst to capture them: it would galvanize a movement of developers betting on the edge with Apple, much like hushh (our team) is "all in" on the belief that "edge and on-device will be the king of AI workloads." By aligning with that vision and empowering it openly, Apple ensures those developers flock to its platform rather than, say, an open Android equivalent.

4.0 Apple vs. the Competition: A Strategic Comparison

To further strengthen the case, consider how Apple's open-source AI strategy would stack up against key competitors and their approaches:

4.1 Nvidia (GPU Dominance)

Nvidia currently reigns in AI hardware via its CUDA software ecosystem and powerful GPUs. Importantly, Nvidia achieved developer mindshare by supporting developers extensively –

through free libraries (cuDNN, TensorRT), SDKs, and close partnership with popular frameworks (PyTorch, etc.). While CUDA is proprietary, it became a de-facto standard because it was accessible and well-supported for anyone doing AI research. Apple's hardware is different (NPUs and integrated GPUs focused on efficiency), but to compete for AI workloads, Apple must similarly win developers' hearts. Open-sourcing its AI frameworks would be a bold counter to Nvidia's model. For instance, Apple's unified memory and Neural Engine could handle many inference tasks more cost-effectively on a Mac or iPhone than a power-hungry GPU in a data center – but only if developers optimize for them. By open-sourcing tools like MLX and Core ML, Apple allows the community to integrate Apple Silicon support into mainstream AI workflows (perhaps even adding an Apple backend to PyTorch, etc.). This could start to shift some workloads off Nvidia GPUs to Apple devices at the edge. While Nvidia remains focused on cloud and enterprise AI (with massive H100 GPUs in servers), Apple can carve out a huge niche of distributed edge AI on its billion-device network. Each iPhone is like a mini NVIDIA in the user's pocket, if developers target it. Open strategy helps ensure they do. In short, Apple won't beat Nvidia by copying its closed model, but by outflanking it: leveraging distribution (millions of Apple Neural Engines in the wild) and openness (so that developing for Apple Silicon is as inviting as developing for CUDA). Nvidia's stack is closed-source and increasingly viewed as a single-vendor risk; Apple can present a more open, community-driven alternative.

4.2 Google (TPUs and Android)

Google's AI strategy has combined proprietary hardware (TPU accelerators, Pixel phone NPUs) with open-source software leadership (TensorFlow, Keras, and contributions to JAX, etc.). By open-sourcing TensorFlow in 2015, Google rapidly became a central hub for AI development, which in turn funneled developers toward Google Cloud and TPUs for training. Android, while open-source, has lagged in on-device AI consistency because the hardware varies by manufacturer. Samsung and others use a mix of chips, and Google itself has taken a hybrid approach (some on-device processing, but heavy tasks on cloud for Google Assistant, etc.). Apple can differentiate by offering one vertically integrated, privacy-first platform. However, it should emulate Google's open-source outreach: imagine Apple releasing an "AI Kit" for iOS akin to TensorFlow – a library devs can use cross-platform but that shines on Apple hardware. Or open-sourcing Apple's model architectures for things like Siri's new generative features. Google's Gemini (next-gen AI model) will likely be cloud-based and

closed; Apple's response could be an open on-device model that developers can build into apps. Google's open-source efforts proved that giving away some IP can greatly boost your platform's adoption. Apple's own open-source history (WebKit powering Safari, open-source Darwin OS underpinning macOS/iOS) shows it understands this in other domains. Now is the time to extend it to AI. By doing so, Apple can assert leadership against Google by saying: we have both the privacy of on-device and the open innovation of community-driven AI. That narrative would resonate strongly with developers who are increasingly uneasy with Google's data-hungry approach.

4.3 Meta (Open-Source Models and Frameworks)

Meta (Facebook) has aggressively open-sourced AI tech – from the PyTorch framework (now the default research toolkit) to large models like LLaMA and Segment Anything. This has earned Meta huge goodwill and influence in the AI research world, despite not selling hardware to developers. The open release of LLaMA, for instance, led to hundreds of creative projects and derivatives in a matter of weeks (from fine-tuned chatbots to optimizations to run it on phones). Apple stands to gain a similar explosion of innovation if it were to open up its models or produce its own version of an LLM for devices. Meta's open strategy is also about capturing mindshare from Google – and it succeeded; PyTorch overtook TensorFlow in usage largely because of community contributions and flexibility. Apple can ride this trend: for example, contribute Apple-specific optimizations to PyTorch (they have added an MPS backend for Mac GPUs already) and to Core ML format converters, all in open forums. If Apple were to open-source a suite of pre-trained on-device models (for vision, speech, NLP) under permissive licenses, many developers would choose those by default for their apps – locking them into Apple's ecosystem when it comes time to deploy to users' devices. Meta's lesson: open-source yields influence disproportionate to one's direct market share. Apple, with a comparatively smaller share of AI research publications, could leap into a position of thought leadership by embracing openness and championing the cause of edge AI. In doing so, Apple would also counter the narrative that "open AI = Linux/Android, closed AI = Apple." Instead, Apple can become the leading open platform for private, on-device AI, which is a unique and powerful position.

In summary, each competitor underscores a facet of why Apple should go open: Nvidia shows the importance of a robust developer ecosystem (which openness can cultivate); Google shows how open software can drive platform adoption; Meta shows that open

models/frameworks can set industry standards and attract talent. Apple, by being more open than ever, can combine all these advantages while staying true to its USP of privacy and integrated hardware. No other company has this same combination. It's an opportunity for Apple to seize the mantle of developer's favorite in the AI era, just as it once did in the mobile app era – but this time by leveraging openness as a strategic weapon.

5.0 The Edge is the Future – Apple Must Lead It

Industry experts increasingly agree that the next phase of AI will involve moving computation from centralized cloud servers to the edge – our personal devices and the "Internet of Things." Apple is uniquely positioned to lead this shift. It controls a vast edge compute network (iPhones, iPads, Macs, Watches, even Vision Pro headsets) all with custom silicon that excels at AI tasks. By doubling down on on-device AI, Apple not only plays to its strengths but also aligns with the broader technological and societal trend favoring edge AI.

VentureBeat observes "a broader trend of shifting computational power from the cloud to edge devices" and notes that Apple's focus here leverages the efficiency of Apple Silicon to deliver great performance "without compromising privacy or performance." This is a one-two punch that cloud-based AI cannot match: cloud AI might offer sheer horsepower, but it struggles with latency, offline access, and exposes privacy attack surfaces. Edge AI offers immediacy and trust. Apple's strategy should declare that edge AI is the endgame, and by open-sourcing its edge AI tooling, Apple ensures that its ecosystem becomes the richest and most attractive for edge AI development.

Consider also the cost advantage of on-device AI. Running large models in the cloud (e.g., serving millions of queries on ChatGPT) incurs enormous GPU server costs – costs often passed down to developers or constrained by paywalls. But if those same AI features run on the user's device, the marginal cost is essentially zero – the user's device is providing the compute power.

One analysis estimated on-device processing could reduce cloud costs by >60% for AI applications. This could be transformative for startups and indie developers: build your AI

app for iPhone, and you don't need a costly cloud backend to scale – every user's phone is your inference server.

Apple should encourage this model because it makes developers dependent on Apple's hardware (good for device sales) and on Apple's developer tools. By open-sourcing whatever is needed "under the hood" (model runtimes, quantization libraries, etc.), Apple can make developing on-device AI not only cost-efficient but developer-efficient. In other words, easier than developing a cloud AI service. If successful, this would tilt many new AI services to launch "iPhone-first" or "Mac-first," turning the usual cloud-first mentality on its head.

It's worth noting that even environmental and infrastructure factors favor edge AI. Power consumption in aggregate can be lower when millions of devices do small tasks, versus huge data centers churning on every request. Apple can market on-device AI as greener. Also, network limitations in many regions mean cloud AI is not reliable for real-time needs – edge AI removes that dependency. All these points strengthen the long-term case that edge/on-device AI will dominate many use cases (ubiquitous AR, personal assistants, health monitoring, etc.). Apple's best chance at owning that future is to rally developers around its platform now – and openness is the rallying cry that will get their attention. As one comment aptly put it, "LLMs [and AI] are the fastest growing application in history. It is very important to every platform. [Android, Linux, etc.] will adopt something similar to MLX if they haven't already." If Apple hesitates to open up, others will fill the gap with open-edge initiatives (for instance, there are already community projects to run LLMs on Android devices). The time is ripe for Apple to dominate the edge AI narrative by being first to truly embrace open-source at the core of its strategy.

6.0 Recommendations for an Open-Source Apple AI Strategy

To achieve the above, Apple's leadership (Tim Cook and the Strategic Priorities Committee) should consider a multifaceted plan that amplifies open-source engagement without sacrificing Apple's competitive edge. Key recommendations include:

1. **Open-Source Core AI Frameworks and Libraries:** Apple should fully open-source critical ML frameworks like Core ML, Create ML, and associated tooling. Portions of these (like coremltools) are already on GitHub, but the entire stack (model runtime,

conversion tools, training helpers) should be available under a permissive license. This allows developers to understand how models run on iOS, optimize them, and even contribute back improvements. It also reassures enterprises and researchers that Apple's AI tech is not a black box. Importantly, an open-source Core ML could become a standard for mobile AI model format/execution, much like ONNX is a standard exchange format – further entrenching Apple's influence.

2. **Expand and Officially Support MLX and Related Projects:** The MLX array framework is a hit among those who've tried it, but currently it lives in a somewhat unofficial capacity (under a separate ml-explore GitHub org). Apple should bring MLX into its official Apple GitHub account, indicating long-term commitment, and continue investing in its development. By doing so, Apple provides a clear signal that Apple Silicon is a serious ML platform for the future. Additionally, Apple can support adjunct projects: for instance, improving the Metal Performance Shaders (MPS) backend for PyTorch and TensorFlow, and open-sourcing any proprietary bits of the ANE compiler or Metal compiler optimizations for ML. Apple could even collaborate with the PyTorch project to make Apple devices a first-class target (on par with Nvidia GPUs) – something that open sourcing its libraries would facilitate.

3. **Open Hardware Interface (without giving away secrets):** While Apple likely won't open-source chip designs, it can still open up low-level APIs and documentation for its AI hardware. For example, providing developers with an open specification or SDK for the Apple Neural Engine execution could spur third-party innovation. Imagine academia being able to write research papers on novel ANE utilization because Apple provided enough technical detail openly. This doesn't mean revealing proprietary transistor layouts; it means sharing how to efficiently feed data to ANE, what operations it supports natively, etc. Currently, Core ML abstracts ANE usage – but an open API could let advanced developers harness it more directly (similar to how CUDA lets one target the GPU specifically). Even if such an API is limited, open documentation could lead to community-built tools (as some enthusiasts have already attempted with reverse-engineering ANE). The easier it is to target Apple's NPU, the more cutting-edge AI apps will appear exclusively on Apple devices.

4. **Release Reference Models and AI Services as Open Source:** Apple's own AI models – for example, the image generation model in iOS, or the transformer-based Apple GPT that powers the new features – should be released to developers, preferably under open licenses or at least accessible for local use. If Apple has concerns about fully open-sourcing a large proprietary model, even providing it as an on-device package with a transparent API is helpful. However, the ideal scenario is Apple open-sources a series of high-quality models (vision, language, multimodal) that are optimized for its hardware. It could host these on Hugging Face (as it did with the 20 models in 2024) or on its own GitHub. The message to developers: "Here are state-of-the-art models that you can use and modify freely, and they run best on Apple Silicon." This would entice developers away from third-party models that might not be as well-optimized for iOS. In tandem, any developer-facing AI cloud services Apple introduces (for instance, an API for iCloud-based large model inference, or collaborative training using Apple's cloud plus on-device federated learning) should come with client libraries that are open source. Apple could even adopt a model like OpenAI's – but inverted – where the models themselves are open, and the value Apple provides (and potentially charges for) is seamless integration and deployment through its ecosystem.

5. **Foster an Open AI Developer Community and Events:** Apple should amplify its open-source AI initiative with strong community-building. This could include dedicated Apple AI Developer Forums (with Apple engineers actively engaging on open-source project discussions), regular open-source updates in WWDC talks, and perhaps an annual Apple AI Summit for researchers and developers (similar to how Apple hosts the WebKit contributors or Swift community events). By shining a spotlight on open-source contributions – for example, highlighting top community-submitted optimizations to MLX or showcasing an App Store success built on Apple's open AI tools – Apple can encourage even more participation. Essentially, marketing and community relations should treat external open-source developers as an extension of Apple's AI team. Internally, Apple might also incentivize its AI research group to publish and open-source more of their work (beyond just MLX) – similar to how Google Brain researchers publish papers and open code. The more Apple's name is associated with cutting-edge AI projects on GitHub or arXiv, the more AI talent will gravitate towards Apple (both to use and to work for).

6. **Maintain a Careful Balance – Open at the Core, Integrated in the Product:** As Apple goes open, it should still ensure that the best user experience is on Apple's own devices and services. Open-source should cover the foundational layers (frameworks, model code, tools), while Apple can still provide proprietary polish on top in its consumer-facing apps. For example, Apple could open-source the underlying model of a feature like Visual Look Up or Siri's new capabilities, but keep some integration details closed. This way, competitors can't instantly replicate the full feature on their platforms, but the developer community can trust and build with the core technology. Apple's openness thus becomes a means to strengthen platform loyalty without losing the differentiation of its end-user products.

By executing on these recommendations, Apple would signal to the world that it is serious about leading in AI – not by mimicking others, but by doing what Apple does best: combining technology and user-centric principles (like privacy)… and now doing so in partnership with the open-source community. Such a strategy, communicated clearly to Tim Cook's team and implemented, could transform Apple's image in the AI industry overnight. It would go from a perceived laggard (quiet about AI, no large cloud chatbot announcements) to a dark horse leader: the company that unlocked AI for everyone by baking it into the devices we all use, and by inviting everyone to collaborate in its ecosystem.

7.0 Conclusion (Part I)

Apple stands at a crossroads in the AI revolution. It has world-class hardware for on-device AI and a respected stance on privacy, but to fully realize its potential, it needs the exuberant support of the developer and research community.

Embracing an open-source strategy for Apple's AI infrastructure is the key to catalyze that support. By open-sourcing "whatever it takes" – from core libraries to model implementations – Apple will capture developer mindshare in a way that few expect from the traditionally secretive company. This bold shift would yield a domino effect: developers rush to build AI-first apps on Apple platforms, users benefit from amazing AI experiences optimized for their devices, and more users choose Apple devices because they become known as the best place to experience AI. In turn, this drives device sales and service

engagement, pleasing shareholders with new growth avenues (imagine the narrative of Apple as a major AI player rivaling Nvidia or Google – investor excitement would follow).

In the final analysis, an open-source Apple AI strategy perfectly aligns with Apple's core strengths. It turns the privacy-first, on-device approach into a rallying cry that distinguishes Apple in the AI market. It builds a developer moat around the iOS/macOS ecosystem, as apps and models optimized for Apple will outperform elsewhere. And it transforms Apple's brand in AI from a quiet follower to a visionary leader setting standards in collaboration with the community. Apple has always been the "ace of aces" in integrating hardware and software – now it can add a fourth ace: open-source leadership in AI. It's a high-impact move that promises enormous payoff in ecosystem vitality and market share, and it's the surest path for Apple to remain a fair – even dominant – competitor in the AI era, not just through its distribution of devices, but through distribution of ideas and innovation. As the saying goes, "a rising tide lifts all boats" – by open-sourcing its AI tide, Apple can lift its entire ecosystem to new heights.

8.0 Sources (Part I)

Apple & VentureBeat announcements on Core ML models and on-device AI ; Apple ML Research blog on ANE throughput and Core ML tooling ; InfoQ report on Apple's open-source MLX framework ; Reddit discussions on Apple's open-source stance ; Apple Newsroom release on M3 Ultra's AI capabilities ; and industry analysis on on-device vs cloud AI trends.

PART II

Apple's Future Value Under an "Open AI" Strategy – A Munger-Style Analysis

9.0 Introduction

Apple Inc. has been the crown jewel of many investors' portfolios – including Charlie Munger's Berkshire Hathaway – thanks to its massive free cash flow (FCF), sticky ecosystem, and relentless innovation. Now, as artificial intelligence (AI) becomes "a force of nature" akin to electricity, Apple faces a strategic crossroads: whether to open up its platform and tools to AI developers more broadly, or continue its traditionally closed, tightly-controlled ecosystem. In this analysis, we adopt Charlie Munger's rigorous, truth-seeking approach – focusing on fundamentals, long-term effects, and realistic projections – to evaluate how an "Open Apple" AI strategy might unlock shareholder value versus the status quo. We will examine Apple's free cash flow trajectory, competitive moat, and the impact on stakeholders (shareholders, developers, users, employees, and suppliers) under two scenarios: (A) Apple embraces an open AI-centric ecosystem, and (B) Apple remains on its current path without major changes. By projecting Apple's Fair Market Value (FMV) in 2026, 2027, and 2036 under each scenario, we aim to determine whether this strategy could meaningfully enhance Apple's long-term investment appeal in Munger's eyes.

10.0 Munger's Analytical Lens: Quality, Moats, and Long-Term Value

Charlie Munger's investment philosophy emphasizes a few key principles that guide this analysis: (1) Focus on high-quality businesses with durable competitive advantages ("moats"), (2) Base decisions on factual evidence and logical reasoning (avoiding hype or wishful thinking), (3) Consider the long-term trajectory of cash flows and growth (looking out a decade or more), and (4) Weigh both the upside and the risks ("invert, always invert" – ask what happens if things go wrong). Munger famously noted that great companies are worth holding, and even advised that investors "need to own stocks like Apple and Alphabet" or risk being left behind. However, he is also skeptical of over-optimistic hype – for instance, he cautioned that "old-fashioned intelligence works pretty well" in response to the AI buzz. In our analysis, we will apply Munger's balanced approach: optimistic about Apple's strengths, yet vigilant about challenges and the need to adapt. The goal is to determine the most

rational, fact-based outlook for Apple's value if it pursues an open AI ecosystem strategy versus if it doesn't.

11.0 Apple's Current Fundamentals and Moat

11.1 Massive Cash Generation

Apple today is a cash-generating juggernaut. In fiscal 2024, Apple produced about **$108.8 billion in free cash flow,** up ~9% from the prior year (despite a slight dip in 2023). Analysts forecast Apple's annual **FCF to remain roughly flat around $109 billion in 2025 and then rise to $125–139 billion by 2026–2027**. This implies mid-single-digit FCF growth ahead – a respectable, if slowing, trajectory. Apple's ability to convert revenue to cash is remarkable; its free cash flow margin stands around 25–27%, providing ample money for dividends and the massive share buybacks that Munger and Buffett love (Apple aggressively repurchases shares, boosting per-share metrics).

11.2 A Wide and Sticky Ecosystem

Apple's greatest competitive advantage – its "moat" in Buffett/Munger terms – is its tightly integrated ecosystem of hardware, software, and services. The iPhone (which still contributes over 50% of revenue) is the hub of an ecosystem that includes the App Store, Macs, iPad, Watch, and services from iCloud to Apple Music. Customers tend to be "very, very, very locked in" to Apple's products. Warren Buffett observed that "Apple strikes me as having quite a sticky product and an enormously useful product to people who use it". Once a user is in Apple's ecosystem, they are unlikely to leave – a testament to its brand loyalty and user experience. This "sticky" consumer behavior has given Apple a quasi-monopoly in the premium smartphone segment; Apple's active installed base is now over 1.8 billion devices, each a potential source of services revenue and an incentive for developers to build for iOS.

11.3 Services Growth and High-Valuation

In recent years, Apple has grown its **Services segment** (App Store, subscriptions, etc.) at a **~12% CAGR, reaching ~$78 billion in annual services revenue**. This recurring revenue, combined with hardware sales, has led investors to award Apple a premium valuation. As of mid-2025, Apple traded around 35× earnings (P/E), significantly above its 10-year average ~20×. Its price-to-sales near 7.4× also far exceeds industry peers. This rich valuation reflects

optimism for Apple's continued dominance and perhaps expectations that new innovations (like AI features) will reinvigorate growth. However, it also "prices in flawless execution", leaving little room for stumbles. Munger would note that at such a premium, Apple must carefully defend and extend its moat to justify being a great investment going forward.

11.4 Threats on the Horizon

Despite its strength, Apple's fortress faces growing challenges. Global smartphone demand is mature, and rivals like Samsung (23% market share) compete fiercely with AI-infused devices. Apple's recent iPhone sales have been relatively flat – e.g. up just 2% year-over-year in early 2025 – and customers are holding onto phones longer (37 months on average), indicating slowed upgrade cycles. New hardware like the $3,499 Vision Pro (AR headset) saw only niche uptake (≈500k units, vastly outsold by cheaper alternatives). Moreover, regulatory pressures are mounting: Antitrust authorities, especially in Europe and the U.S., are scrutinizing Apple's App Store policies and ecosystem lock-in. In fact, the U.S. Department of Justice recently sued Apple, explicitly describing Apple's closed ecosystem as a "wide and deep moat" that "crushes innovation" and harms consumers. Regulators argue Apple's moat-building hasn't led to lower prices or better choices for users. Such pressures could force Apple to open up aspects of its platform (e.g. allowing third-party app stores or sideloading) or at least adapt its business practices – potentially undercutting the very moat that has been so lucrative. In Munger's terms, capitalism's "assault on the castle" is underway ; Apple must either innovate and adapt or risk its moat being eroded by competitors and regulators.

Given this context, Munger's team would likely conclude that Apple remains a phenomenal business – one with huge cash flows, an unparalleled ecosystem, and top-notch management – but also that the company is at an inflection point. The coming AI revolution is one such inflection: Will Apple ride this wave to enhance its ecosystem (and thus its financial growth), or will it lag behind more AI-focused rivals? Let's now consider the proposed strategy in that light.

12.0 The Proposed "Open Apple" AI Strategy

The "proposal" in question is for Apple to open up its ecosystem more broadly to AI APIs and app developers of all kinds. In practical terms, this might involve:

- Offering developers deeper access to Apple's AI technologies and hardware – e.g. providing APIs to Apple's native AI models (Siri's intelligence, on-device machine learning, etc.), or even allowing third-party AI models and services to integrate more seamlessly with iOS.
- Reducing barriers and restrictions for app developers leveraging AI – ensuring that apps incorporating AI (e.g. generative AI features, custom ML models) can thrive on the App Store without undue rules or high fees. Possibly, this could include more favorable terms for AI-driven apps or allowing alternative app distribution methods in a controlled manner.
- Collaborating with the broader AI community – for instance, supporting popular AI frameworks, contributing to open-source AI projects, or enabling interoperability (so that Apple devices can work smoothly with AI services from OpenAI, Google, etc.).
- Continuing to invest in Apple's own AI capabilities but with an eye toward making them "AI for everyone", not just closed Apple-only features. This could mean Apple's AI initiatives (like the new "Apple Intelligence" features) are designed as platforms that third-party developers and partners can build upon, thereby multiplying innovation.

In fact, we have already seen the first steps of this strategy: at WWDC 2025, Apple announced a pivotal shift by opening up its on-device AI "Foundation Models" to developers. Apple introduced a framework that lets app developers integrate advanced AI into their apps with as little as "three lines of Swift code". This initiative, part of what Apple brands as "Apple Intelligence", effectively democratizes access to powerful AI tools on Apple devices. Apple is leveraging its custom silicon (neural engines in M1/M2 chips and the latest iPhone processors) to run large models locally, emphasizing privacy and efficiency. By doing so, Apple encourages developers to build AI-rich apps exclusively optimized for Apple's platform. The result, as one analysis noted, is a "self-reinforcing loop" – developers flock to Apple's AI tools, users get richer app experiences, and this further entrenches Apple's devices as the go-to place for seamless, privacy-centric AI applications.

Apple's Craig Federighi introduces "Apple Intelligence" – a suite of on-device generative AI features – at WWDC 2024. Apple is branding its AI as "AI for the rest of us," integrating text, image, and assistant capabilities across iOS apps. By enhancing Siri and providing new developer APIs for AI, Apple is taking initial steps to ensure its ecosystem remains at the cutting edge of the AI revolution.

This strategy of a more "open Apple" for AI aims to unlock value on multiple fronts:

- **Accelerating the AI-App Economy:** By lowering the barrier to create AI-driven apps on iOS, Apple could spark a new wave of innovative applications and services. For example, educational apps can easily generate personalized quizzes, or photography apps can use on-device AI to edit images via natural language commands. Many of these use cases weren't feasible on mobile before. With Apple's tools, developers can now create experiences that keep users within Apple's ecosystem for tasks they might otherwise do on external platforms. An AI-rich app ecosystem not only differentiates Apple devices but also increases usage (and potentially monetization through App Store revenues or subscriptions).

- **Strengthening the Moat via Privacy & Integration:** Apple's approach focuses on on-device AI, which aligns with its longstanding privacy stance. Unlike Google or OpenAI's cloud models that send user data to servers, Apple can tout that "your data stays on your iPhone." This is a competitive moat in markets (enterprise, healthcare, government) that demand data security. By opening its AI to third-party apps while maintaining control over privacy and quality, Apple cleverly balances openness and ecosystem control. It widens the moat: developers get access to powerful models only available on Apple hardware, and users concerned about privacy prefer Apple's solution. In Munger's terms, this is an example of a company widening its moat by leveraging a unique strength (privacy-focused design) and technological advantage (custom silicon).

- **Fostering Goodwill with Developers:** An "open" strategy could also mend some frayed relations with developers. Historically, critics argued Apple's walled garden stifles third-party innovation. By actively enabling developers of "all shapes and sizes" – from indie app makers to big AI startups – to succeed on its platform, Apple stands to create a thriving, sustainable ecosystem where external developers and businesses

can profit (not just Apple itself). Indeed, the App Store already facilitated $1.1 trillion in developer billings and sales in 2022, with over 90% of that revenue going to developers (not Apple). Apple's ecosystem has supported ~4.8 million jobs in the app economy across the US and Europe. Those numbers underscore how a healthy ecosystem enriches many stakeholders. If AI is the next frontier, ensuring that AI developers thrive on Apple's platform will attract more talent and investment into Apple's orbit. (Notably, smaller App Store developers have been growing revenue faster than large developers in recent years – a sign that openness and opportunity are increasing. An AI push could continue this trend by enabling new entrants with novel AI ideas to succeed.)

- **Pre-empting Regulation:** An oft-overlooked benefit of "opening up" is reducing the anti-monopoly pressure. By showing that it encourages outside innovation (rather than "crushing" it), Apple could weaken regulators' arguments. If Apple provides access to its once-exclusive capabilities (like device AI or a dominant app marketplace) in a fair way, it may avoid harsher remedies like forced breakups or third-party app store mandates. In Europe, Apple is already being pushed to allow alternate app stores; a proactive open strategy might let Apple shape the narrative (e.g. by ensuring security and quality in any new openness). In essence, a bit of openness now could preserve Apple's autonomy later. Munger's team would certainly weigh this factor, as regulatory risk directly impacts the certainty of Apple's future cash flows.

Of course, this strategy isn't without risks or trade-offs. Opening up must be done in a way that doesn't undermine Apple's user experience or revenue model. For instance, allowing third-party AI engines might be great for innovation, but Apple must ensure these integrations don't create security holes or bypass its ability to monetize. (Apple will likely still require that any paid AI services in apps go through in-app purchase for commissions, for example.) There's also execution risk: Apple's own AI efforts have been criticized as slow or "incremental" – Siri, once an early player, fell behind Alexa/Google Assistant. If Apple's new open AI initiative isn't truly competitive with the likes of OpenAI's GPT-4 or Google's Bard, developers might not flock to it. In that case, simply "being open" wouldn't draw value; the underlying tech must be first-rate too. Munger would insist on a clear-eyed assessment: Does Apple have the talent and tech to be a leader in AI? The evidence suggests Apple is

investing heavily (with AI research, acquisitions, and custom silicon), but it's an area to monitor.

On balance, however, if executed well, the "Open Apple for AI" strategy aligns with Munger's rule of ensuring a business adapts to maintain its moat. Apple would be effectively playing offense – using its strengths (ecosystem, hardware, privacy) to capture the AI wave – rather than letting competitors dictate the pace. Now, let's translate these strategic moves into tangible projections for Apple's financial future, and thereby its estimated fair value in coming years.

13.0 Stakeholder Impact: Ecosystem-Wide Value Creation

One way to analyze the long-term effects of Apple's AI-open strategy is to consider each major stakeholder group and how they'd benefit. As Munger might ask, "Where does the lollapalooza (major synergistic effect) come from?" The answer lies in creating a positive feedback loop for all parties in Apple's ecosystem:

13.1 Shareholders (Owners)

The most direct benefit for shareholders is accelerated growth in revenue and free cash flow stemming from AI-enabled products and services. If Apple can boost its services revenue with new AI-driven offerings, it adds high-margin dollars to the top line. Analysts estimate that AI-driven services (like enhanced iCloud, AI creative tools, personal AI assistants, etc.) could add 10–15 billion per year by 2027 to Apple's revenue. Given Apple's 253 billion in annual FCF by 2027 – not huge relative to Apple's base, but meaningful on the margin. More importantly, embracing AI could preserve Apple's market share and pricing power in hardware. Customers may be more willing to upgrade iPhones or Macs for cutting-edge AI capabilities (e.g. an iPhone that runs advanced vision or language models locally). This upgrade incentive could counter the lengthening device replacement cycles. Even a modest uplift in hardware sales volume or pricing, combined with new high-margin software offerings, would compound over time. For shareholders, that means Apple's growth doesn't stagnate at low single digits but perhaps sustains at high-single or double-digit rates for a while longer. More growth plus Apple's ongoing buybacks and careful capital allocation = higher intrinsic value. (We quantify the projections in the next section.) There's also the defensive angle: an Apple that fully participates in the AI boom is less likely to be displaced in the consumer

tech hierarchy. As Munger noted, owning dominant tech franchises is almost necessary these days – shareholders want Apple to stay one of those dominants in 5, 10, 15 years. An open-AI strategy helps ensure that, whereas ignoring AI could let rivals erode Apple's dominance (a worst-case for investors).

13.2 Developers and Vendors (Partners)

Third-party developers stand to gain a richer toolset and larger addressable market. If Apple's 1.8+ billion devices gain new AI capabilities, developers can create new app categories (generative art, AI tutors, intelligent enterprise apps, etc.) and tap into user demand. Apple's App Store ecosystem already generated $1.3 trillion in commerce in 2024 (globally) for developers, with over 90% of proceeds going to those developers. With AI features, this pie can grow further – for instance, through new subscription services (developers might sell AI content or features via the App Store, on which Apple earns its 15–30% cut). Importantly, small developers could particularly benefit, as AI might level the playing field by allowing tiny teams to offer powerful features via Apple's pre-trained models. The result is a more vibrant app economy, where not only Apple profits, but thousands of app companies do too. This positive sentiment keeps developers loyal to iOS (versus diverting resources to Android or other platforms). It's worth noting Apple's relationship with developers has been strained at times over App Store fees and rules; showing developers that "we are giving you the latest tech and a fair chance to succeed" will strengthen goodwill. Meanwhile, Apple's hardware supply chain vendors (chipmakers, component suppliers, etc.) also benefit if device sales are strong. For example, on-device AI requires potent chips – Apple's investment in AI can lead to higher demand for advanced silicon (TSMC making Apple's chips), memory (for AI processing), camera sensors (for computer vision features), and so on. Apple's success thus feeds a virtuous cycle for its suppliers, who can invest in capacity and innovation to support Apple's needs. All partners thriving means a robust ecosystem that competitors will find hard to crack.

13.3 End Users (Customers)

Ultimately, if end users don't benefit, any strategy will fail. Fortunately, an AI-enhanced, more open Apple should be a big win for customers. They would enjoy more capable apps and services – imagine iPhones that can act as intelligent personal assistants, creative studios, or health coaches. Already, Apple has integrated features like AI writing tools across

Messages/Mail (to draft messages or summarize text) and image generation ("Genmojis" and an Image Playground app) for creative visuals. A revitalized Siri can perform cross-app tasks fluidly (e.g. "edit this photo and text it to Alex") thanks to AI, something Siri struggled with before. As third-party apps build on Apple's AI, users will get functionalities that previously required juggling multiple apps or services. A richer experience increases user satisfaction and stickiness: an iPhone that handles daily tasks via AI integration is even harder to give up. Moreover, Apple's emphasis on privacy means users get these benefits without feeling like "the product" themselves – a contrast to, say, Google's data-hungry approach. From Munger's perspective, delivering real value to customers is what sustains a company's profits long-term. Happy users lead to repeat sales (upgrades, services subscriptions) and word-of-mouth advantage. If Apple can say its products are objectively more useful in the AI age, it can likely maintain its premium pricing and ecosystem lock-in without alienating customers.

13.4 Employees

Apple's workforce thrives when the company is innovating and growing. An open AI strategy would signal exciting new projects internally – attracting top AI researchers, engineers, and keeping current talent motivated. Apple has historically had to fight for AI talent with the likes of Google and OpenAI; being fully committed to AI (and doing impactful things with it) helps Apple recruit and retain the best minds. Additionally, when a company's strategy is succeeding, employees see tangible rewards (career growth, potentially stock-based compensation gains as the stock price rises). From the rank-and-file engineer to top management, a successful AI ecosystem expansion means pride and payoff – they are working on products that millions love and that secure Apple's future. Munger often praises companies with strong cultures and talented people; empowering Apple's teams to push the boundaries likely enhances that culture of innovation. Conversely, if Apple were seen as "lagging" in the hottest tech trend, it could demoralize employees or cause talent defection. So this strategy can energize the entire organization.

13.5 Society at large

(This is beyond what the question directly asks, but in full Munger spirit one might note the broader impacts.) If Apple's closed ecosystem were to bottleneck AI innovation, it could slow down the dissemination of AI benefits. By opening up, Apple contributes to the wider

advancement of technology. Millions of users get access to AI in a safe, user-friendly way, and countless developers can distribute AI-driven solutions via the App Store. This widens the reach of AI (potentially bringing its productivity benefits to education, health, small businesses, etc.), analogous to how electricity or the internet spread. A vibrant Apple-led AI ecosystem might also pressure competitors to up their game, spurring industry-wide progress. Munger, with his philanthropic and societal interests, might approve of a strategy that not only profits Apple but also drives human progress responsibly (as long as it aligns with shareholder value).

In summary, the open AI strategy creates a positive-sum game: Shareholders get more growth, developers and suppliers make more money, users get better products, and Apple's brand and culture strengthen. This is the kind of scenario Munger loves – where multiple forces combine (a "lollapalooza effect") to reinforce a company's success. However, this optimistic outcome hinges on execution; it assumes Apple indeed delivers AI tech that developers and users embrace, and that it navigates potential pitfalls (competition, execution delays, etc.). With these qualitative impacts in mind, let's project how they translate to Apple's financial outlook and valuation in concrete numbers for 2026, 2027, and 2036.

14.0 FCF Growth and Fair Value Projections (2026, 2027, 2036)

Using Munger's focus on free cash flow and long-term compounding, we'll project Apple's value under two scenarios: Scenario A: Apple fully embraces the open-AI strategy, and Scenario B: Apple stays its current course without major changes. We'll start with known consensus forecasts for the near term, then extrapolate to 10 years out, noting how the strategy could alter those trajectories.

14.1 Baseline (Consensus) Outlook

Wall Street consensus (which implicitly assumes Apple will introduce some new products but doesn't factor in any extreme changes) expects Apple's FCF to be about $109 billion in 2025, $125.8 billion in 2026, and $139.0 billion in 2027. That equates to FCF growth of ~0.5% in 2025 (flat year), then +15% in 2026 and +10% in 2027. These jumps likely assume a combination of factors: a rebound in product sales, continued Services growth, and perhaps improved profitability as high-cost investments (like the first-gen Vision Pro) start paying off. If Apple's

stock were to trade at a free-cash-flow multiple around 25× (which is roughly equivalent to a P/E in the mid-20s, consistent with its strong moat status), those FCF figures would imply:

- **2026 FMV (Fair Market Value):** ~$125.8B FCF × 25 = $3.15 trillion market capitalization. Depending on share count by then (Apple keeps reducing it), the share price might be in the low-to-mid $200s. For instance, if shares outstanding in 2026 are ~14.2 billion (assuming continued buybacks), $3.15T is about $222 per share.
- **2027 FMV:** ~$139B FCF × 25 = $3.48 trillion market cap. With perhaps ~13.5 billion shares by FY27, that's roughly 257 per share. Notably, this aligns with some analysts' price targets in the mid-200s for Apple within a couple of years. In fact, an AI-focused analysis cited a consensus target range of 250-280 by 2027 if Apple executes well on services growth and hardware upgrades.

Now, how does Scenario A (Open-AI Apple) alter these numbers? And how about Scenario B (No major AI push)?

14.2 Scenario A – Open-AI Apple (Accelerated Growth Case)

Under this scenario, Apple successfully capitalizes on AI across its products and ecosystem, as described earlier. The key financial effects would likely be: (1) incremental revenue from new AI-driven services/features (e.g. higher App Store sales, new subscription offerings, etc.), (2) slightly higher hardware unit sales or pricing due to AI differentiation (customers upgrade more frequently or opt for higher-end models to get the best AI features), and (3) sustained high margins (Apple keeps its premium pricing and gains efficiency via on-device AI, which might reduce reliance on costly cloud services). While we shouldn't expect explosive growth (Apple's law of large numbers prevents, say, 30% annual jumps), even a few extra percentage points of growth sustained over years can significantly boost long-term value.

By 2027, if AI features add, say, 10–15 Binannual revenue (as some analysts estimate) and Apple's total revenue growth ticks up into the high single digits (rather than stagnating mid-single digits), FCF could be at the consensus 139B. For instance, Apple's services gross margin is quite high (~70%), so an extra 10B in services revenue might add 7B in operating profit, ~$6B in FCF after tax – a ~5% bump to FCF. Hardware AI advantages might also protect or expand iPhone revenues. It's plausible that by 2027 FCF could reach $145–150B with the wind at Apple's back. That would put the approx. 2027 FMV at $3.6–3.8 trillion (at

~25× FCF), or roughly 270–290 per share. This is on the higher end of current expectations – essentially achieving the 280 optimistic target some have speculated. Looking further out, to 2036 (10-year horizon), Scenario A could allow Apple to maintain a solid growth rate longer than it otherwise would. Let's make a reasonable projection: If Apple's FCF grows at, say, 8%, 110B in 2025, doubling in 10 years implies around $220B FCF by 2035–36. For context, 8% CAGR is above expected global GDP growth but below the growth rates of many smaller tech firms – however, Apple might achieve it by both growing revenue and continuing aggressive share buybacks (which increase FCF per share). If Apple in 2036 is still seen as a top-tier company (likely, if it navigates AI well), it might trade at perhaps a 20× FCF multiple (as a more mature, slightly slower-growing giant by then). A 20× multiple on $220B gives a market cap of $4.4 trillion. If growth and competitive positioning remain excellent, a 25× multiple isn't out of the question, which would yield $5.5 trillion market cap. Thus, Apple's valuation in 2036 (Scenario A) could realistically be on the order of $4–5.5 trillion. In share price terms (and Apple's share count will likely shrink further by then), Apple could be well above $300 per share a decade from now – perhaps in the $350–400 range, assuming significant buybacks continue (reducing shares toward ~12 billion or fewer). The total shareholder return from today's 3T market cap (190–200/ shareinmid - 2025) to 5T in 2036 would be strong – plus dividends along the way – reinforcing Apple as a top investment over the decade.

It's worth noting that such growth would keep Apple outrunning inflation and almost certainly beating the broader market if achieved, given its current size. Munger would view that as a successful outcome: Apple would remain one of the world's most valuable businesses, compounding shareholder wealth year after year – a testament to its adaptability and quality.

14.3 Scenario B – Status Quo Apple (Slower Growth/Risks Case)

In the alternative scenario, Apple either does not meaningfully change its strategy or fails to execute on AI, effectively ceding the initiative to competitors. What might this look like financially? We can take warning signals from some recent analyses. Currently, analysts project Apple's revenue growth slowing to ~6.4% annually for the next few years, down from a ~13% average in the past decade.

If Apple's AI efforts remain only incremental (e.g. minor Siri improvements, nothing game-changing), it's likely that Services growth stays around the 10–12% level (or could even

taper if, say, App Store fees are regulated down), and hardware sales might stagnate or decline slightly in real terms (particularly if rivals out-innovate in AI features). Some have pointed out that Apple's services, growing ~12%, are far below the 30%+ growth of the broader AI-driven software market – implying Apple is not capturing the big new opportunities.

In a status quo scenario, this gap could widen: e.g. Microsoft, Google, etc., could grow their AI cloud or software revenues much faster, leaving Apple's Services as a slower-growth segment by comparison.

If Apple's FCF only grows in the low single digits (or oscillates with economic cycles), we might see something like: FCF ~ 110B in 2025, 120B in 2027 (instead of 139B), and perhaps only modest growth to ~$130–150B by 2036.

For instance, even a 3% annual FCF growth would take $110B to about $148B in 10 years; 4% would get near $163B. So call it 150B ±10.

At, say, an 18× FCF multiple, and assuming 140B FCF in 2036 (midpoint of that stagnation range), Apple's market cap would be $2.5 trillion. That is actually lower than today in real terms (though higher nominally, but remember inflation might make $2.5T in 2036 worth less than $3T today). Even at a 20× multiple on $150B, it's $3.0T – essentially flat from today's size after 10 years.

The stock might float around 180–200 in the late 2020s, and perhaps still be in that neighborhood or only slightly higher by 2036 (depending on buybacks). In fact, bearish analysts have warned that Apple's current stock price already factors in a lot of perfection.

One analysis pegged Apple's fair value at about $217.59/share (roughly 2.8T) given its slowing growth, suggesting the upside is limited unless Apple over-delivers. In a no-change scenario, if growth disappoints, Apple's stock could even correct downward in the near term (some see a pullback to <180 as a buying opportunity).

We saw hints of this in late 2023 when Munger himself commented on high valuations; if the market rotates away from big tech or if Apple has a hiccup (e.g. an iPhone cycle that underwhelms), a lower multiple could swiftly shave off market cap.

By 2036, in the worst-case sub-scenario, if Apple truly missed the AI boat and lost significant ground (imagine a future where, say, Android/Google or others dominate AR glasses or AI assistants and Apple's offerings are considered second-rate), Apple could even face declining FCF.

That's a relatively low probability given Apple's resilience, but not impossible – think of once-dominant tech firms that stagnated. Munger's principle of "even giants must adapt or perish" rings true. We won't dwell too much on a doomsday for Apple (since the company has many strengths to prevent that), but it's clear that the gap between adapting vs. not adapting is enormous over a decade.

The AI revolution is seen as the next major platform shift; failing to lead or at least keep up could relegate Apple from the best-of-breed investment to a middling performer.

14.4 Difference in 10-Year Outcome

Summarizing the two futures:

- **With Open-AI strategy (Scenario A):**

  Apple remains among the world's tech leaders in 2036, potentially achieving ~4–5T+ market value (perhaps 350–400/share). FCF might be 200B+, and Apple would still be compounding value for shareholders. Total return (including dividends) from 2025 to 2036 could be on the order of +70% to +100% (which for a $3T company is extraordinary, but reflects 7–10% annualized return, aligning with long-term market beating).

  Crucially, Apple would continue to be viewed as a "must-own" quality stock, just as Munger advocated, because it successfully navigated the AI era and expanded its moat (with privacy, silicon, ecosystem lock-in).

- **Without the strategy (Scenario B):**

  Apple might stagnate around ~$2.5–3T market cap (in 2025 dollars) or only modestly higher, effectively delivering minimal real returns over a decade. Its stock might oscillate and perhaps track the broad market at best. There's risk of a sharper falloff if

a failure to innovate coincides with an external shock (regulation splitting off the App Store, a competitor releasing a paradigm-shifting device, etc.).

In this scenario, Apple could fade from the "best investments" list; it would still be a very profitable company (with FCF maybe 130–150B), but investors might treat it more like a cash cow to be milked than a growth story – i.e. a source of dividends/buybacks, but not much capital appreciation. Munger might compare it to something like Coca-Cola or Gillette in recent decades: solid, but no longer high-growth – "great company, not sure if great stock at current price."

Indeed, one could foresee Berkshire trimming its Apple stake in such a scenario to redeploy capital (especially if the stock's multiple stays high without growth, which was a concern cited: Apple at 35× earnings "leaves little room for error").

Given these outcomes, the delta created by the AI strategy is huge. **By 2036, we're talking about potentially trillions of dollars of difference in market cap (perhaps $4–5T vs. $2.5T)** and a solidification of Apple's status as one of the best investments, versus a story of peak and plateau.

Even by the mid-2020s (2026–27), embracing AI could be the difference between Apple stock climbing into the 250–300 range versus languishing around 180–220.

It's important to note that not all of this is solely because of "AI" in isolation – it's a proxy for overall innovation and ecosystem health. But AI is likely the defining tech force of the next decade (much as mobile was in the 2000s, and the internet in the 1990s). For Apple, which already has the platform and user base, it's more about how AI features are integrated and leveraged to enhance the ecosystem.

Munger would evaluate this with a clear mind: does spending/investing in AI yield a good return on invested capital for Apple? The early signs indicate yes – for example, integrating AI can make Apple's products more useful without drastically increasing their cost (running AI on-device uses Apple's existing chip capabilities). It also can introduce new revenue streams (small upsells for AI-driven services).

As long as Apple remains disciplined (which it historically has under Tim Cook's leadership, known for operational efficiency and "smart deployment of capital"), the strategy should pay off in value creation.

Metric / Scenario	Baseline (Consensus)	Scenario A (Open-AI)	Scenario B (Status Quo)
2026 FMV	$3.15 Trillion	~$3.15T (initially same)	~$3.15T (initially same)
2027 FMV	$3.48 Trillion	3.8 Trillion	~$3.3 Trillion (Est. based on $120B FCF x <25)
2036 FCF (Est.)	N/A	~$220 Billion	~$140-150 Billion
2036 FMV	N/A	5.5 Trillion	3.0 Trillion
Implied 10-Yr FCF CAGR (Open AI)	N/A	~8%	N/A
Implied 10-Yr FCF CAGR (Status Quo)	N/A	N/A	~3-4%

15.0 Conclusion – Munger's Verdict on Apple's Future Value

In the spirit of Charlie Munger's no-nonsense analysis, we distill the findings: Apple is highly likely to remain one of the world's great businesses in the coming years, but whether it remains one of the great investments will depend on its adaptation to the AI era. Apple's enormous free cash flows and entrenched moat give it a huge advantage – a fortress to defend – yet, as Munger reminds, "competitors will repeatedly assault any business castle earning high returns". The rise of AI is precisely such an assault, bringing both threats (AI-savvy rivals, changing consumer expectations) and opportunities (new products, services, efficiency gains).

If Apple embraces an open, innovation-friendly approach to AI – as our Scenario A outlines – it can widen its moat and find new paths for growth. Concretely, this could boost Apple's FCF

growth from ~5% to closer to ~8-10% annually in the medium term, lifting its intrinsic value markedly. By 2026–2027, Apple could achieve a fair value in the high $200s per share (around $3.5 trillion market cap), assuming successful AI-driven product cycles. Over a 10-year horizon, with sustained innovation, Apple's market cap might approach $5 trillion or more, delivering strong compound returns to shareholders. In this scenario, Apple in 2036 would likely still be viewed as "one of the best investments" – a company that not only maintained its dominance but expanded into new arenas (possibly AR, automotive, health, etc., all supercharged by AI). It's the kind of long-term compounder that Munger and Buffett cherish: a business with an enduring moat, run by able stewards, that continues to throw off more cash each year.

On the other hand, if Apple chooses not to substantially change course or falls behind in the AI race, the company's financial might may slowly lose momentum. The stock could remain range-bound as growth underwhelms and the market de-rates its valuation multiple. Apple might still generate immense cash flows (making it a stable company), but much of that cash could end up just offsetting a lack of revenue growth (through buybacks and dividends) rather than fueling exciting new ventures. By 2036, Apple could find itself overshadowed by more dynamic companies that seized the AI advantage – a position that would shock those used to Apple always being on top. From an investment perspective, it could transition from a growth stalwart to a more pedestrian, bond-like equity. As one analysis starkly put it, "The future of tech belongs to innovators, not incumbents… AAPL's stock is priced for perfection in a world where perfection is fading." In Munger's terms, failing to adapt could turn Apple into one of those former "Roman candles" of business – a once spectacular castle whose moat was crossed because it didn't keep up.

Munger's likely stance: Apple should indeed pursue the open AI-centric strategy, but do so in a way that preserves what is great about the business (its ecosystem control, brand, and prudence). The analysis shows that the strategy offers significantly more upside than downside. It aligns with creating long-term value for all stakeholders – a positive-sum outcome that Munger, a rational optimist, would appreciate. He would caution, of course, to avoid hype and ensure that any AI investments meet a high bar ("High quality at a fair price", even in R&D spending). But given the potential for AI to enhance Apple's core advantages (user experience and privacy) and revenue streams, it appears to be a classic case of strengthening the moat to protect and extend Apple's compounding machine.

To answer the original query plainly: **By 2026–2027, an Apple that fully embraces an open AI ecosystem could be worth on the order of $3.5 trillion (or more) – roughly 10-20% higher than a status quo Apple. And by 2036, the gap could be even wider: Apple might double its value from today under the right strategy, versus potentially stagnating without it.** In dollar terms, we might be looking at an Apple valued around $5 trillion vs. $3 trillion a decade out, depending on the path taken. That is the difference between an investment that continues to richly reward its shareholders and one that merely holds ground.

> Charlie Munger often emphasizes being "consistently not stupid" over being brilliantly clever. In this case, it seems "not doing this" (ignoring the AI platform shift) would be a stupid mistake for Apple – one that erodes shareholder value in the long run. Conversely, "doing this" – opening Apple's ecosystem to catalyze an AI boom – is a smart, perhaps necessary evolution that leverages everything Apple is good at (integrating software & hardware, curating user experience, empowering developers) for the next technology era.

The numbers and qualitative factors we've examined support the notion that Apple's future FMV and status as a top-tier investment look far brighter with the AI-centric strategy than without.

In conclusion, approaching it from Munger's viewpoint: Apple is fundamentally strong, but to maintain its fair value growth and trounce the market over the next decade, it must harness the power of AI and welcome external innovation into its ecosystem. Do that, and Apple likely remains "the best investment" on the street; shy away, and Apple could slip from its pedestal. Munger would favor the path that maximizes long-term truth and value – here, that means betting on an open, AI-empowered Apple as the winning strategy for 2026, 2027, and far beyond.

16.0 Sources (Part II)

Sources

- Buffett, W. & Munger, C. – Comments on Apple's ecosystem and moat

- Apple Inc. – Free Cash Flow history and forecasts (2020–2027) ; App Store ecosystem economic impact
- AInvest Analysis – "Apple's AI Developer Ecosystem: Blueprint for Dominance" (WWDC 2025 updates on AI strategy)
- AInvest Analysis – "Apple Faces Growing Risks – Time to Sell?" (valuation concerns, competition)
- AInvest Analysis – "Apple Faces Existential Threats in AI Era" (AI competition, fair value estimate)
- TechCrunch – "Apple Intelligence: Everything to know about Apple's AI" (Apple's generative AI features and Siri update)
- Business Insider – "Regulators use Buffett's 'moat' concept in Apple lawsuit" (DoJ antitrust describing Apple's closed ecosystem).

Important Disclaimer Regarding Financial Calculations

The reader is advised that while the business analysis, cited revenue metrics, and qualitative discussions presented in this document are based on information considered reliable, the specific mathematical calculations underpinning future financial projections—such as Free Cash Flow (FCF) and Fair Market Value (FMV)—are preliminary and have not yet undergone independent human verification. These quantitative financial forecasts should be reviewed and validated accordingly before being relied upon for decision-making.