

**Individual Ideas Assessment: Modular Accessibility Keyboard vs Home Network Security Device**

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## **Idea 1**

### **Overview and Need**

My business idea is a fully modular keyboard system designed to be interchangeable between gamers and office professionals, with extra modules catering towards users with accessibility needs. The traditional setups communicate through on-board electronics through a series of magnetic pogo (or spring-loaded) pins that pass data through a high-speed USB-C 3.2 connection to a central hub, and accessibility focused modules (one-handed configurations, breath-controlled configurations, foot pedals, etc.) come with long cables included for ease of placement. The product combines raw gaming performance, professional comfort, and inclusivity all in one unified platform, filling a gap in the market where consumers typically need separate, specialized devices.

### **Evaluation of Potential**

This product exists to serve multiple markets – the assistive technology market, and the mechanical/gaming keyboard market. The global assistive technology market is projected to grow from \$22.9 billion in 2023 to \$36.6 billion by 2033, and over 2 billion people are estimated to require at least one assistive product by 2030, which creates a real need for accessibility-focused input devices in today's digital era. The mechanical and gaming keyboard market is estimated at \$2.05 billion in 2024, projected to grow to \$5.68 billion by 2033, with the gaming segment alone valued at \$2.01 billion in 2023 and projected to grow to \$3.87 billion by 2030.

The product is scalable through base units and upgradable modules for multiple types of users, creating the ability to operate across markets. This means that modules with hot-swappable switches, RGB lighting, and macro clusters could be released for the gaming market, ergonomic layouts, key shapes, and magnetic wrist rests can be deployed for the office market, and various accessibility modules can be released, all with full interoperability. This Lego brick type of approach allows for the product to serve multiple use cases without the need to reinvent the wheel for each type of user. A software ecosystem would also be designed for these devices, allowing users to create macros, program specific keys and keystrokes, and create multiple profiles for their peripherals. User profiles could be local or cloud based, with a recurring cloud subscription offering advanced analytics for power users such as community profile sharing, institution-level deployment and locking down of devices, and macro analytics. In addition to the profit provided through the subscriptions, mechanical keyboards are often sold with 30-50% margins, allowing for sizable headroom.

The chief challenge to this idea is the complexity and cost required for research and development of this technology. Designing modular hardware with hot-swappable components and accessibility modules that are meant to be durable greatly increase the costs required for both R&D and manufacturing. The keyboard and input device landscape is also greatly competitive, with companies like Corsair, Logitech, and Razer dominating both the professional and gaming scene. Lastly, there are significant access gaps for accessibility components – assistive devices are largely expensive or unavailable, with insurance reimbursement/coverage for these devices being sparse.

### **Discovery Process**

I discovered this opportunity through my thorough immersion in the gaming and mechanical keyboard communities, as well as seeing how a friend of mine with cerebral palsy is able to use their computer. In my personal experience, there are many debates about which keyboard is best for which

job, with no major player taking the cake since Topre took the professional scene by storm with their rubber dome keys. With accessibility devices becoming prohibitively expensive with their margins hung on insurance payments coming through, and said devices having a stunning lack of integration and software support, a gap for a truly modular solution that serves everyone has become more and more apparent. This combination of mainstream mechanical keyboard appeal with the integration of accessibility modules fills that gap.

## **Idea 2**

### **Overview and Need**

My second business idea is a cybersecurity device that connects to a household router and provides proper encryption and protection for all connected devices. This device would offer real time threat detection, privacy monitoring, parental controls, and network security through a simple and intuitive dashboard that is accessible locally. As IoT (Internet of Things) smart home devices become more and more commonplace, households are more vulnerable to cyber threats such as hacking and data theft. While traditional antivirus software can protect individual devices, they cannot secure the entire home network as a whole. Most consumers lack the cybersecurity knowledge needed to properly configure firewalls or detect suspicious activity, so this plug-and-play device fills that need. Businesses have access to large, rack-mounted cybersecurity appliances, there are little to no all-in-one hardware solutions for the consumer level that provide that same security. Existing solutions are either software-based with limited protection, built into routers with unintuitive interfaces and low customization, or require technical skill to configure. My idea seeks to fill the skill gap by offering a centralized and automatic means of security that is designed specifically for the modern household.

### **Evaluation of Potential**

This device seeks to mainly operate in the smart home market, which was valued at \$127.8 billion in 2024, and is projected to rise to \$537.3 billion by 2030. With the amount of IoT devices estimated at 17 billion in 2024, projected to become 25 billion by 2025, the need for a security solution only grows. Around 72% of users are concerned about the security of their smart home devices. Scalability of this product includes platform-specific smart home integration to allow the device to serve as a central control hub, as well as subscription-unlocked features like parental controls, VPN routing, AI threat detection, and device profiling. Partnerships with smart home installers, security companies, electronics retailers, and internet service providers can also serve to the product's scalability and profitability. Eventual upselling can also be an avenue for profit, like serving meshing units for larger homes and offering support packages.

The top concern regarding the challenges and risks associated with bringing this product to market is both consumer awareness and privacy/trust. So many other smart home companies promised to the ends of the earth that they would protect user data, only to get breached and have their records leaked (think of the Wyze leak from June 2025). Consumers in general are also unfamiliar with device-based network security, and may need some form of on-boarding in order to properly understand why this type of protection is necessary. Another challenge associated with running a security-focused company is the constant evolving threats that malicious actors develop. This requires continuous monitoring for zero-day vulnerabilities, and adaptive AI threat detection.

## **Discovery Process**

I thought of this opportunity through my experience in the cybersecurity field. My company has an incredibly expensive main firewall that serves a lot of the functions I've described in my writing, and I don't see remotely the same levels of security being offered direct-to-consumer. I also stay up-to-date on cybersecurity happenings, whether that be the introduction of new technology or security breaches, and I've seen plenty of smart home appliances and devices being used in malicious ways, or hacked to have user data leaked online. I felt like a good business idea would be a device designed specifically for ease-of-use for regular customers to be able to easily protect their outbound data.

## **Comparative Analysis**

Comparing the two business ideas, they differ by magnitudes in scale. The modular and accessible keyboard idea responds to the growing demand for personalized peripherals and accessible input solutions, especially within the \$2 billion gaming keyboard market. While the accessibility focus of the concept is innovative, the keyboard space itself is crowded with major players and profitability would rely on the modular accessories and a subscription service that is unnecessary to normal users. The cybersecurity idea, however, provides an easy solution to protecting an entire consumer's network. With the explosive rise of smart homes and IoT devices, the cybersecurity threat that households face only grows. Double-digit growth is expected over the next five years, and the subscription model offered provides substantially more features than the one explored for the keyboard idea. That, combined with the broad appeal from families to small business owners, it fills a gap left by traditional enterprise-grade firewalls and software-based solutions.

Based on my current skill set, I think that the 2<sup>nd</sup> idea would be easier for me to comprehend and head development. While the keyboard is easier to prototype and less technically demanding, the other option has stronger potential for long-term growth and profitability. It carries more risks, particularly around technical development and consumer trust, but it also has less direct market competition and meets a much larger rising consumer need.

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