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Introducing Portena

A Hybrid Desktop and Decentralized
EC2 model.

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This is only a high-level overview of the project; I will not reveal specific technical details at this time; please contact me for more information.

The Problem

Wastage of Computing Resources

Traditional personal computers (PCs) have been a popular tool for personal and professional use for decades. However, with the increasing demand for more computing power and the rapid development of technology, traditional PCs have become a source of wastage of computing power. One of the primary reasons for the wastage of computing power in traditional PCs is their design. PCs are designed to handle a wide range of tasks and applications, from simple word processing to complex video editing. As a result, they come with a lot of pre-installed software and features that the average user may not need or use, consuming valuable computing power and resources. Additionally, many users tend to use only a fraction of the computing power available on their PCs. For example, the average user may use their PC for web browsing, email, and basic office tasks, which only require a fraction of the computing power available. The remaining computing power goes **unused** and is **wasted**. Another significant factor contributing to the wastage of computing power in traditional PCs is the issue of software compatibility. Over time, software becomes outdated and requires more resources to run, which means that newer versions of software require more computing power to run efficiently. However, many users continue to use outdated software on their PCs, leading to **underutilization** of computing power.

Here is an example of my cpu utilization (I have 6 core processors and 16gb ram) -

- During idle usage (just browsing the web or working on non-intensive tasks), my RAM usage may be around **2-4 GB**.
- During light development work (such as writing code or running a simple program), my RAM usage may be around **4-6 GB**.
- During moderate development work (such as running multiple applications or debugging code), my RAM usage may be around **6-8 GB**.
- During heavy development work (such as running virtual machines or compiling large projects), my RAM usage may exceed **8 GB** and approach the maximum capacity of my computer.

As you can see the rest of the ram is left idle and unused.

Physical Hardware

Physical hardware, such as servers, desktop computers, and other electronic devices, have been the backbone of technological infrastructure for decades. However, as technology continues to evolve at a [rapid](#) pace, physical hardware has become increasingly outdated in many ways.

One of the major issues associated with physical hardware is the constant need for [maintenance and upgrades](#). As technology evolves, hardware becomes [obsolete](#) quickly, and people are forced to constantly upgrade their equipment to remain competitive. This can be an expensive and time-consuming process that requires significant resources, both in terms of money and time. Upgrading hardware can also require additional expenses, such as [software licenses](#) and training for employees.

In addition to maintenance and upgrades, physical hardware has limited [scalability](#). Traditional physical servers and computers have a limited amount of storage and processing power, which can be a hindrance when dealing with high resource usage. This can lead to slow performance and [lag](#), which can be frustrating for users and can impact productivity.

Physical hardware can also be vulnerable to [physical damage or theft](#). This can result in data loss or security breaches, which can be costly and damaging to businesses. In addition to security concerns, physical damage can also result in equipment [downtime](#), which can impact productivity and profitability.

Furthermore, physical hardware can be a burden on the [environment](#). The production and disposal of hardware require a significant amount of resources and energy, leading to environmental concerns. Additionally, the constant upgrades and replacements of hardware can contribute to [electronic waste](#), which can be harmful to the environment if not disposed of properly.

As technology continues to evolve, traditional desktop computers have become increasingly outdated in many ways. With the rise of cloud computing and virtualization, many businesses are moving away from physical hardware in favor of more flexible and scalable solutions. Cloud computing and virtualization offer the benefits of hardware without the need for physical maintenance and upgrades. They also offer more flexibility and scalability, as businesses can easily add or remove resources as needed.

In conclusion, physical hardware has served as the foundation of technological infrastructure for decades, but its limitations and drawbacks have become increasingly apparent in today's

rapidly evolving technological landscape. As businesses continue to prioritize flexibility, scalability, and sustainability, it's likely that we'll see a continued shift away from physical hardware and towards more innovative and efficient solutions.

The Solution

Introducing **Portena**, a device that leverages the power of cloud computing to provide users with a portable and cost-effective alternative to traditional PCs. One of the main advantages of Portena is that it **eliminates the need for physical hardware**, which is both expensive and wasteful. Traditional PCs often come with large amounts of RAM that are rarely used, leading to a significant waste of resources. With Portena, all computing takes place **remotely in the cloud**, which eliminates this waste and makes the device much more cost-effective. Another advantage of Portena is that it leverages the availability of elastic cloud computing resources. By renting computing power from cloud providers, the users pay only for how much they use, cutting costs by over 60%. By this, Portena is able to offer users access to powerful computing resources at a **fraction of the cost of traditional PCs**. **Additionally, with the advent of 5G technology**, the latency of remote computing is virtually zero, which makes Portena an even more viable option for users.

In terms of the hardware used to create Portena, I have been prototyping it with a mere **ESP32 chip and a few VGA cables**, which have proven to be effective thus far. I am also in the process of developing my own remote connection protocol that will be a blend of SSH and VNC. This will further improve the performance and security of Portena, making it an even more attractive option for users. As I continue to develop the prototype of Portena, I have rented some OpenShift infrastructure to test out the elasticity model that I have developed. This model is a modification of the elastic computing solution offered by cloud computing providers, and it allows for greater flexibility and cost savings for users.

Also, I am developing an app on the concept of **computational credits**. The concept of computational credits is an innovative approach that Portena is implementing to provide users with a cost-effective solution to their computing needs. Computational credits are like **digital tokens** that users can purchase in advance and use to access computational resources in the cloud. The way it works is that users can purchase a certain number of computational credits upfront, and then these credits can be automatically deducted based on their usage. This makes it easy for users to manage their costs and only pay for the computational resources they use, rather than having to pay for a fixed plan regardless of their actual usage.

For example, if a user purchases 100 computational credits, and each credit is worth 1 hour of computation time, then the user can use the computational resources for 100 hours. If the user only uses 50 hours, then they will have 50 credits left that they can use later. Using computational credits as a form of marketing can be an innovative approach to increase customer engagement and drive sales. For example - Rewards for online purchases, referral programmes, Social media engagement and loyalty programs. This will surely save the user tons of money, based on my research 60% cheaper

One of the key advantages of Portena is its [portability](#). Due to its small size and minimal hardware requirements, Portena can easily be carried around and used on-the-go. This makes it an ideal solution for people who need to work remotely or who need access to computing resources while traveling. The device is similar to a raspberry pi or a SBC with just a few hdmi ports for the display and usb ports.

Portena's virtual computing concept has the potential to revolutionize not just traditional desktop computing, but also the [mobile and wearable technology space](#). As more and more devices move towards thinner, lighter form factors, the need for hardware-based computing is decreasing. By leveraging cloud computing and virtualization technology, devices can now be designed to rely on remote computing power rather than local hardware. In the case of foldable phones, for instance, the flexible screen technology allows for a larger display area without increasing the size of the device. However, this can lead to limitations in terms of hardware capacity, particularly in terms of RAM and processing power. With Portena's virtual computing model, a foldable phone could rely on cloud computing to perform complex tasks, while maintaining a slim form factor.

Similarly, other wearables such as smart watches or augmented reality glasses could benefit from Portena's technology. By relying on remote computing power, these devices could provide more advanced features without the need for bulky hardware. This could lead to a new era of wearable technology that is both sleek and powerful.

Potential of Portena is indeed [enormous](#), especially with the imminent arrival of [5G](#) technology. With 5G, the latency between the device and the cloud will be reduced to almost [zero](#), making it possible to run applications in the cloud and stream them to devices in real-time without any noticeable [lag](#).

This makes Portena an ideal device for a variety of applications, ranging from [education and gaming to business and personal use](#).

[Decentralized cloud computing](#) can provide additional benefits in terms of security and privacy, as it allows for data to be stored and processed in a distributed network rather than in a centralized location. This can be done by locating servers in every [1km](#) all around the world. This can help to reduce the risk of data breaches or other security incidents, as well as providing greater control over who has access to sensitive data. Also as everything is stored in secure [state-of-the-art data centers](#) there is no possibility of a risk.

There are several devices in the market that are based on this idea but none of them have taken this approach on this level. Truly, portena is completely novel and innovative and first of its kind.

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