



**SimpleWay Technologies Ltd.**

# Uxify AI: Privacy-Preserving Artificial Intelligence/Machine Learning for a Unified Ecosystem

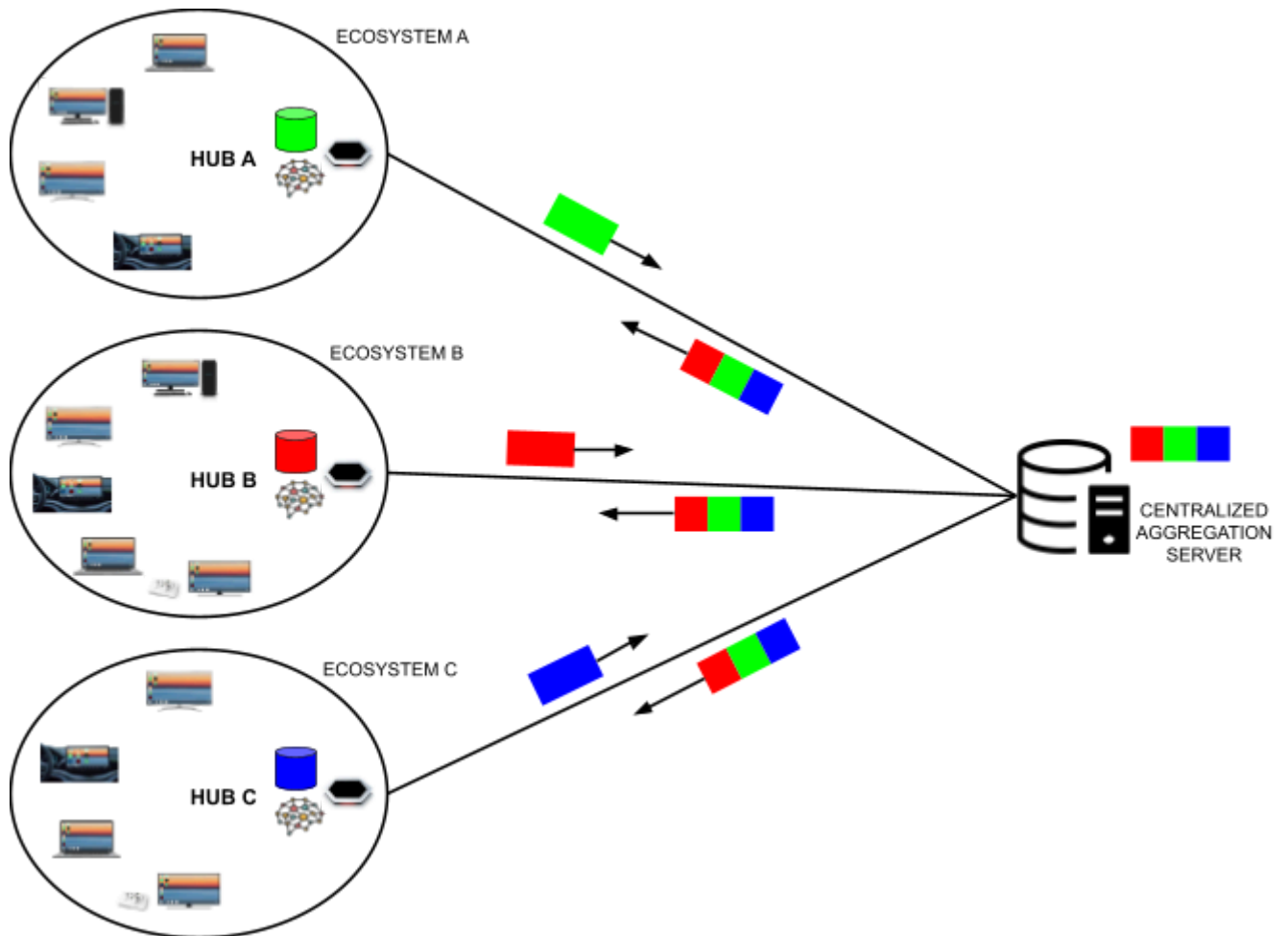
A key pillar of the Uxify ecosystem is Uxify AI, a patent-pending decentralized artificial intelligence and machine learning architecture engineered specifically for privacy-preserving AI/ML model training and deployment across multiple user devices. Uxify AI is designed to address critical challenges faced by distributed systems, such as sensitive data privacy, limited computational resources on edge devices and communication efficiency, making it ideal for smart homes, industrial IoT, healthcare and other connected environments. Uxify AI allows users to work together to perform AI/ML model training and enjoy all the benefits of Uxify.

**UXify. Different devices - unified experience**

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# How Does It Work?



1. Hubs A, B and C control corresponding ecosystems A, B and C. Each ecosystem uses the same AI/ML model with a corresponding parameter set. In each ecosystem, the hub implements the AI/ML model.
2. Hubs A, B and C use data received from the devices in their respective ecosystems to perform training/learning and testing of their implemented AI/ML model, either on their own or in combination with the devices in their respective ecosystems.
3. The obtained AI/ML model parameters from the training/learning is sent to a centralized aggregation server. Referring to the diagram above: parameters from hub A (green), hub B (blue) and hub C (red) are sent to the centralized aggregation server. The received data is never sent and is stored within the ecosystem of each hub.

4. At the centralized server, the obtained parameters from each of the hubs are aggregated together to form an aggregated parameter set. The aggregated parameter set is then transmitted to the hubs.
5. Each of hubs A, B and C then implement their respective AI/ML model using the aggregated parameter set.

## Core Innovations

### Privacy-Preserving Learning

Uxify AI enables model training directly on the hubs on their own or in combination with devices within the ecosystems controlled by the hubs. The parameters from the training and learning are transmitted and the data sets never leave the ecosystem. This significantly reduces risks of data leakage and enhances compliance with privacy regulations.

### Decentralized Coordination via Device Interoperability System (DIS)

Within each ecosystem, each hub performs AI/ML related activities such as:

- Management of data collection from heterogeneous user devices, for example, dynamically scheduling data transfer based on real-time assessment of device power, connectivity and workload, optimizing resource usage and minimizing energy consumption.
- Pre-processing of collected data sets prior to input to model training and learning
- Model training and learning either at the hub or in by distributing workloads to other devices in the ecosystem
- Transmission of model parameters to the centralized aggregation servers for aggregation
- Model implementation within the ecosystem.

## Adaptive Resource Management

Each hub continuously monitors device battery life, processing power and network conditions and schedules AI computations and communications during optimal periods. This balances efficiency and responsiveness while reducing carbon footprint.

## Flexible AI Deployment

The system supports both on-hub inference and offloading computations to more capable devices. This flexibility enables AI functionality even on devices with limited hardware capabilities compared to the hub and potentially avoids the problem of “stragglers” commonly encountered in other privacy preserving systems.

# Benefits and Applications

### ***Enhanced User Privacy***

Sensitive data remains within user control, greatly mitigating risks of centralized data breaches.

### ***Scalable and Efficient Learning***

Bandwidth-optimized decentralized learning enables collaborative model improvements at scale.

### ***Energy Efficiency***

Adaptive scheduling reduces unnecessary data transmission, lowering power consumption and operational costs.

### ***Broad Applicability***

Suitable for personalized AI assistants in smart homes, collaborative IoT devices in industry and secure AI across privacy-conscious industries.

### ***Empowering Resource-Constrained Devices***

Extends AI capabilities to devices traditionally unable to perform heavy computations by leveraging distributed resources.

# Conclusion

Uxify AI exemplifies the next-generation approach to intelligent systems - privacy-centric, decentralized and adaptive - fully aligned with Uxify's vision of a seamless, personal and unified digital ecosystem. By embedding AI directly into the device interoperability framework, Uxify creates a robust foundation for intelligent, secure and environmentally sustainable user experiences across diverse connected devices.

# Notices

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The Uxify technology is patented. For further details, please refer to [www.simpleway.ie](http://www.simpleway.ie)