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Flexibility Exploitation for residential, tertiary and industrial buildings

Deliverable Fact Sheet

D2.3 – Data Management and Security Protocols

Objective

This deliverable defines the data management, privacy, cybersecurity and interoperability framework adopted within the FlexBIT platform. It specifies how operational data are collected, transmitted, protected, stored and exchanged across distributed demonstrators while ensuring secure, interoperable and trustworthy energy management services.

Methodology

The FlexBIT data management framework is organised into six complementary layers:

- Data acquisition from distributed demonstrators
- Standardised data adapters
- Secure communication infrastructure
- Central data processing and storage
- Blockchain-based integrity verification
- Governance, privacy and cybersecurity.

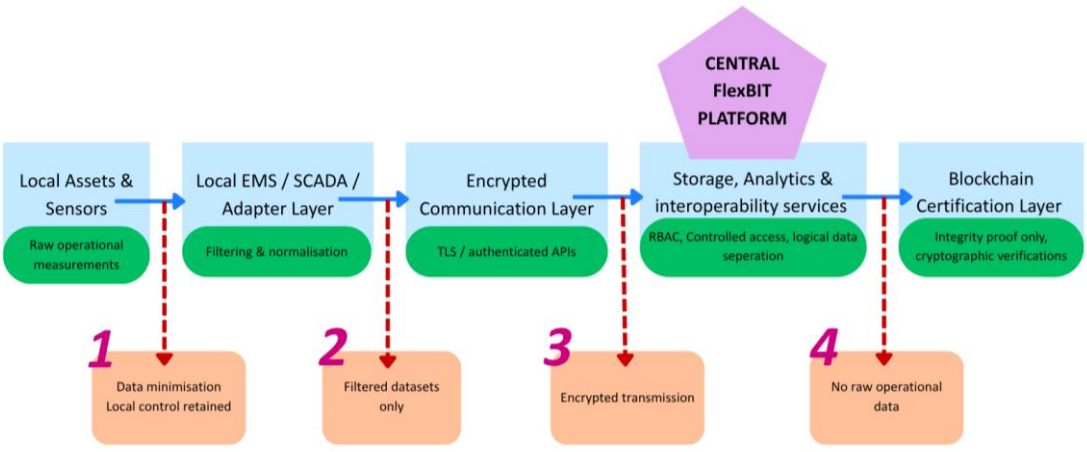

Figure 1 Privacy-preserving operational data flow and privacy controls implemented within the FlexBIT platform architecture. The blue-green boxes indicate the operational flow whereas the orange ones the privacy control

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Key Findings

The FlexBIT platform establishes a common framework for secure data exchange across heterogeneous energy systems.
Main achievements include:

- Harmonised data collection from industrial, residential and tertiary demonstrators
- Standardised APIs enabling interoperability between heterogeneous systems
- Secure communication using authenticated and encrypted channels
- Distributed data architecture combining local autonomy with central coordination
- Permissioned blockchain ensuring tamper-proof verification of exchanged information
- Integrated data governance aligned with European privacy and cybersecurity regulations
- Scalable architecture supporting future energy communities and digital energy platforms.

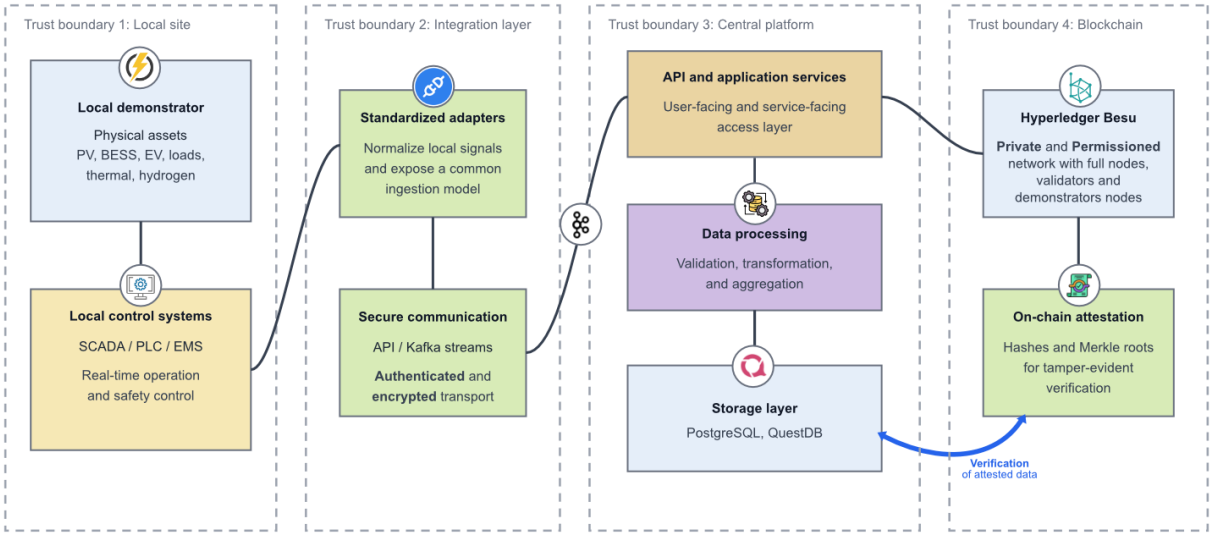

Figure 2 Trust boundaries diagram

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Recommendations

Future digital energy platforms should:

✓ Adopt standardised data models to enable interoperability.
✓ Preserve local control while supporting secure cross-platform coordination.
✓ Protect operational data through encryption and role-based access control.
✓ Separate operational measurements from blockchain integrity verification.
✓ Implement privacy-by-design and data minimisation principles.
✓ Support scalable APIs for integrating new energy assets and demonstrators.
✓ Ensure long-term data governance aligned with European digital regulations and Open Science principles.

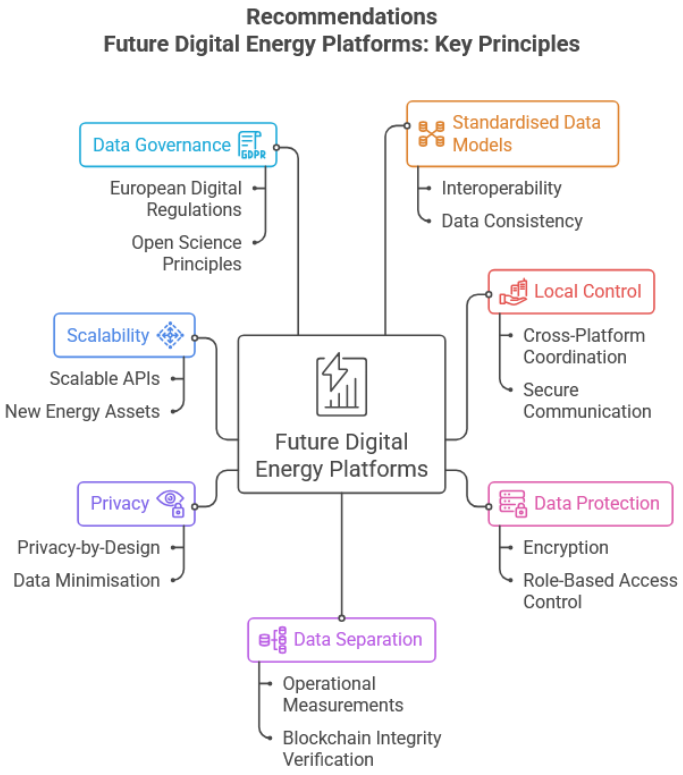

Figure 3 FlexBIT's recommendations

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FlexBIT Partners

FlexBIT Local Funding Agencies

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