DIA1

Final presentation PLM

PRODUCT LIFECYCLE MANAGEMENT

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SUMMARY

1. COMPAGNY OVERVIEW

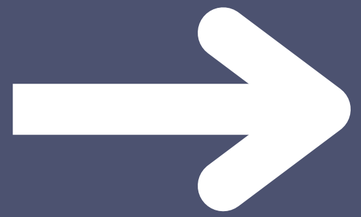
MGO S.A group :

- 2,000 employees worldwide
- Specializing in Agrifood
- 4 main raw material suppliers
- 10 outlets (6 in France, 4 in Belgium)
- 4 newly acquired production sites (2 in Asia, 2 in Africa)

2. DEVELOPPED PRODUCT

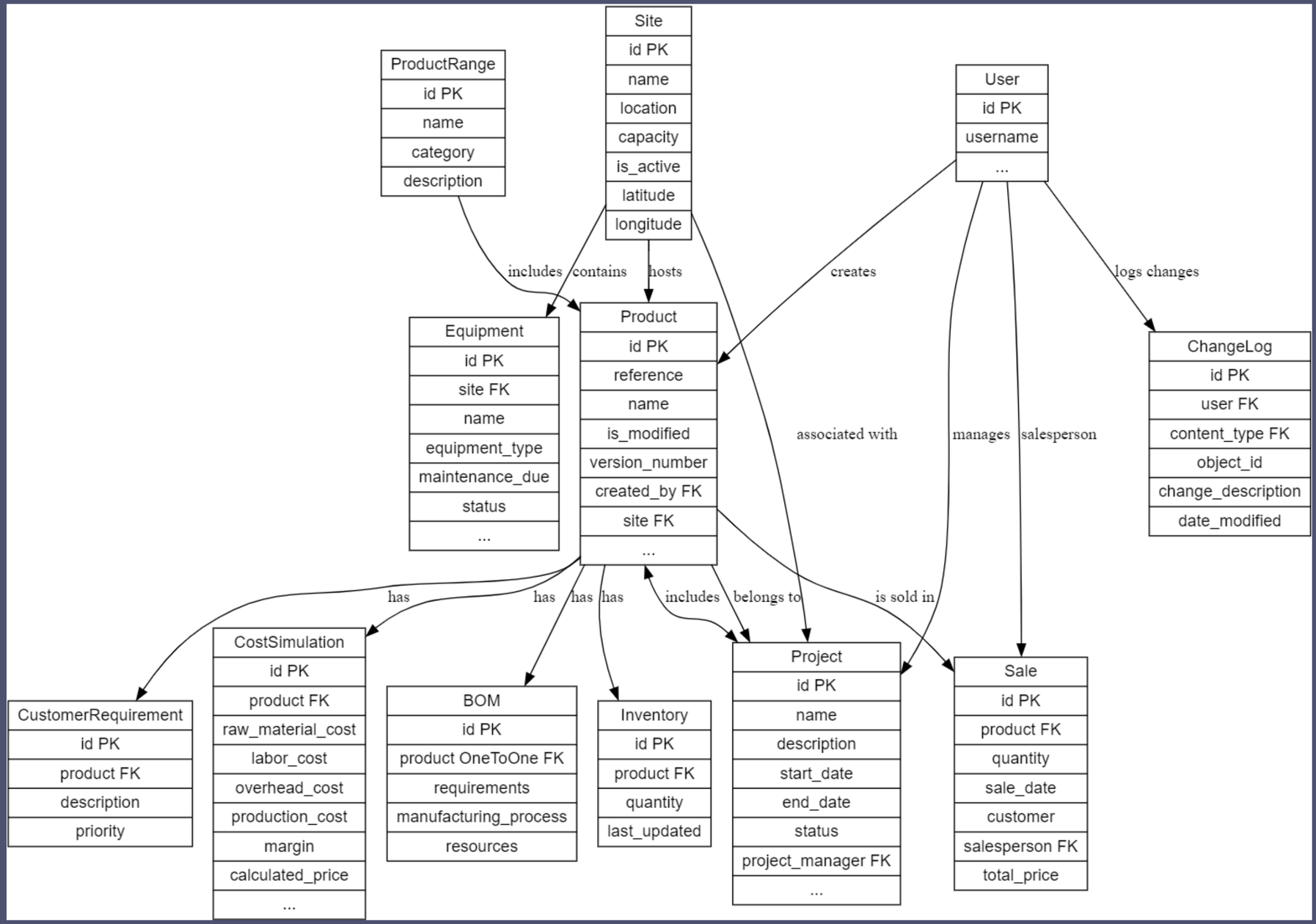
PIP (product innovation platform)

- Product management (details, versions, modifications)
- 3D visualization (STL files)
- Cost simulation (raw materials, labor, overhead)
- Logistics, production sites, equipment, inventory
- Sales tracking and report generation

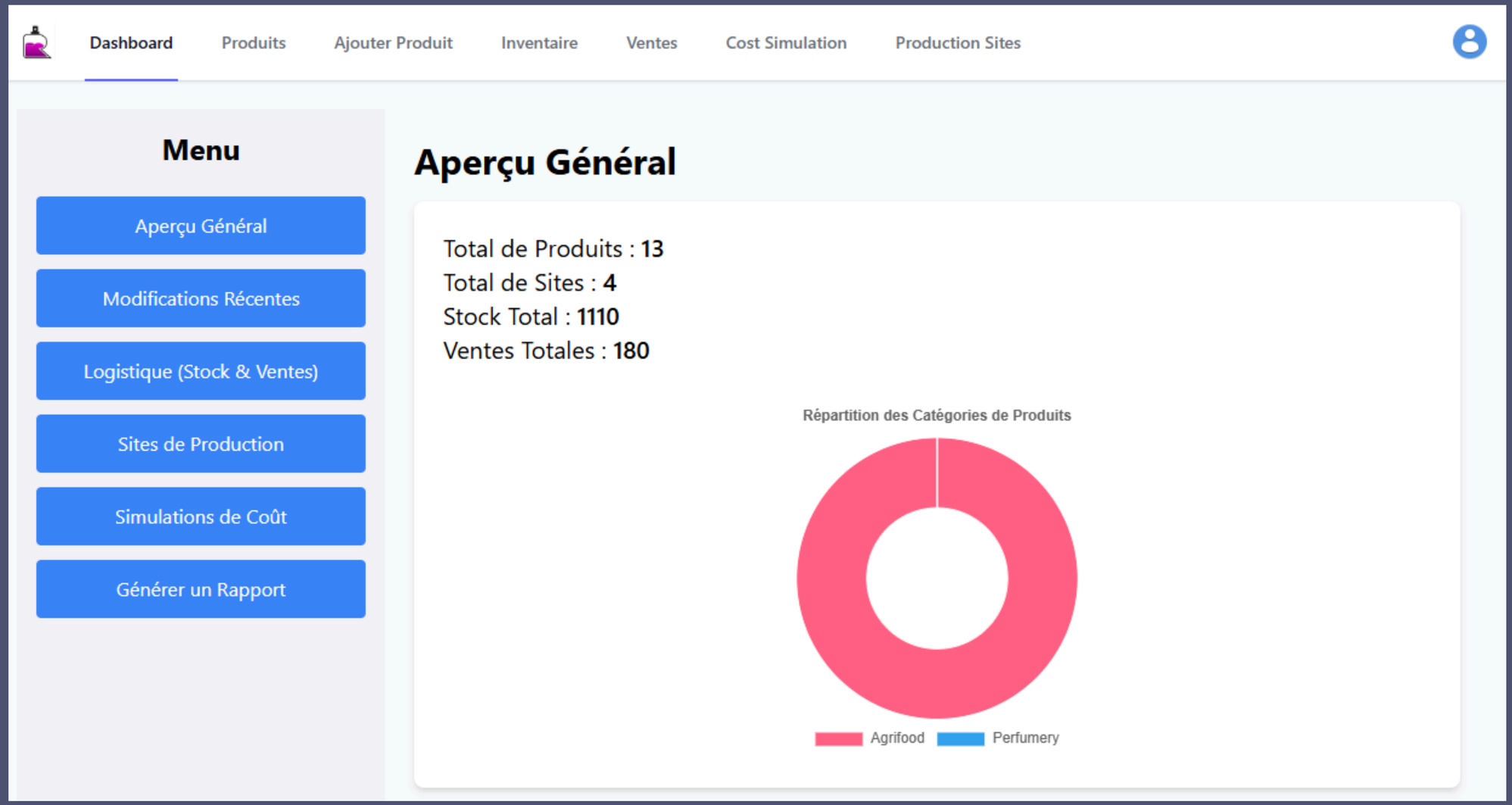


- Improve productivity
- Reduce cost
- Increase revenue
- Ensure the quality of products

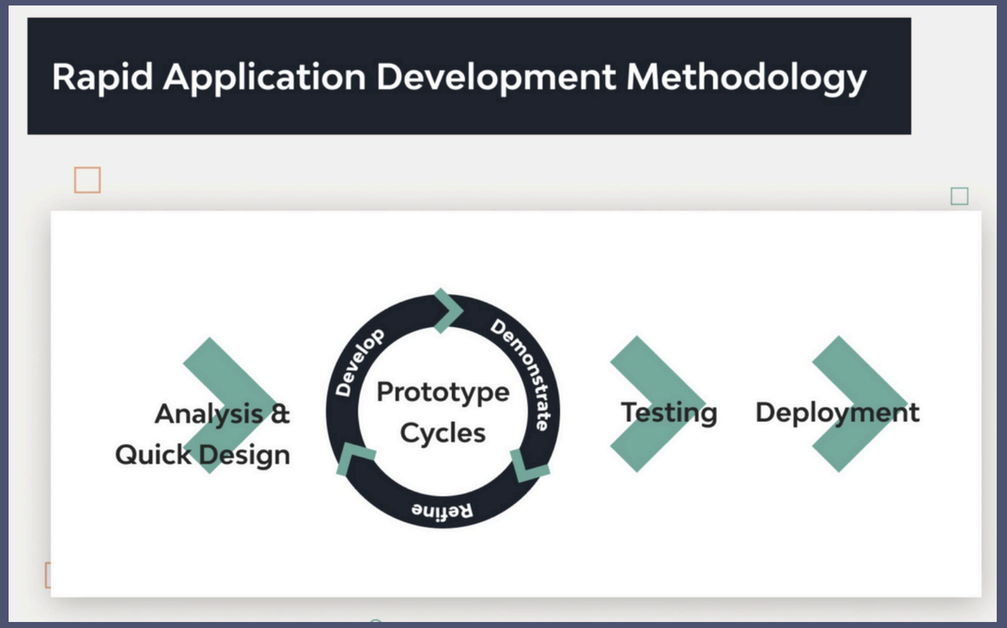
ERD

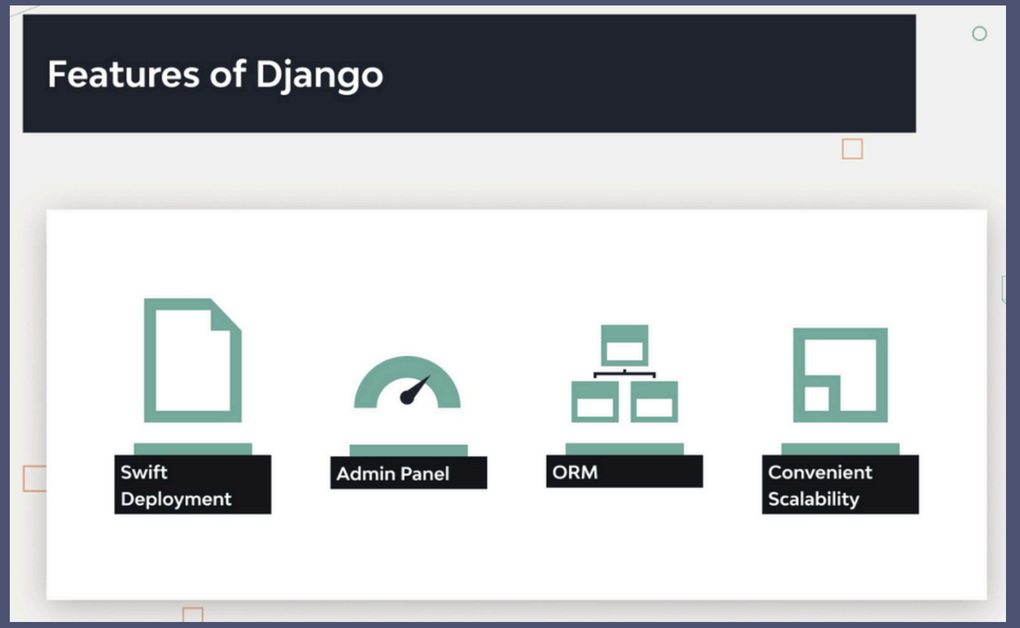

Site
id PK
name
location
capacity
is_active
latitude
longitude
ProductRange
id PK
name
category
description
User
id PK
username
...
includes
contains
hosts
creates
logs changes
Equipment
id PK
site FK
name
equipment_type
maintenance_due
status
...
Product
id PK
reference
name
is_modified
version_number
created_by FK
site FK
...
ChangeLog
id PK
user FK
content_type FK
object_id
change_description
date_modified
associated with
manages
salesperson
has
has
has
has
includes
belongs to
is sold in
CustomerRequirement
id PK
product FK
description
priority
CostSimulation
id PK
product FK
raw_material_cost
labor_cost
overhead_cost
production_cost
margin
calculated_price
...
BOM
id PK
product OneToOne FK
requirements
manufacturing_process
resources
Inventory
id PK
product FK
quantity
last_updated
Project
id PK
name
description
start_date
end_date
status
project_manager FK
...
Sale
id PK
product FK
quantity
sale_date
customer
salesperson FK
total_price

3. ORGANIZATION OF THE COMPANY



4. TECHNICAL SOLUTIONS





- Rapid prototyping with a modular structure.
- Scalable to meet complex PLM needs.

- Directly manage business data without extra development.
- ORM simplifies handling entities like products, BOMs, and sales.

5. APPLICATION DEMO

CONCLUSION

What was accomplished

- Collaborative product management.
- Analytics content.
- Comprehensive management of inventory, sales, and production sites.

Further implementations

- Enhance analytics with new KPIs.
- Incorporate IoT data from equipment sensors.
- Add the STL 3D model for all the products.

ARTICLE

Industrial blockchain based framework for product lifecycle management in industry 4.0

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Key Problems

Traditional PLM systems are

- Centralized, limiting cross-enterprise collaboration.
- Poorly integrated across lifecycle stages .
- Incompatible with Industry 4.0's decentralization needs.

Key Objectives

- Enable seamless data exchange.
- Automate processes using smart contracts.
- Enhance security and trust across stakeholders

Proposed Solution and Core Components

Blockchain Information Service (BIS)

- Processes and broadcasts data to blockchain.

Smart Contracts

- Automates lifecycle tasks (maintenance, recycling).

Decentralized Data Management

- Improved traceability and security.

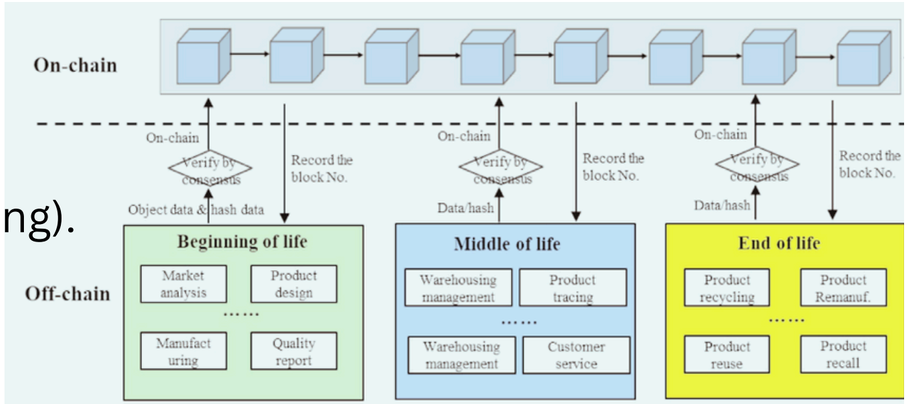

Fig. 3. Three stages of product lifecycles.

Applications

- Co-Design and Co-Creation: Secure collaboration platform.
- Quick Tracking & Tracing (QAT2): Enhanced product traceability.
- Proactive Maintenance: Automated issue detection and resolution.
- Regulated Recycling: Transparent and eco-friendly recycling.

Simulation Results

Performance:

- 20%-30% faster latency than Ethereum-based systems.
- Higher throughput for transactions.

Benefits:

- Improved scalability and security.
- Cross-enterprise interoperability.

Future Directions

- Real-world deployment with more nodes.
- Enhanced stability and user experience.
- Metrics for ROI and operational risks.

The typical comparisons with the existed PLM platform in a qualitative method.

Type of PLM/Characteristics	Traditional PLM/PDM [1,14]	Web based PLM [17]	Agent based PLM [18]	Cloud based PLM [19,20]	Blockchain public cloud PLM [32, 43]	Proposed platform
Scalability	✓	✓	✓	✓	✓	✓
Privacy	✓	✓	✓	✓		✓
Ubiquitous access				✓	✓	✓
Credibility					✓	✓
Openness		✓			✓	✓
Interconnectedness & Interoperability					✓	✓
Decentralization			✓			✓
Flexibility			✓	✓	✓	✓
Security						✓
Near Real-Time Big-Data Processing				✓		✓
Software as a Service				✓	✓	✓
Pay-per-use				✓	✓	✓

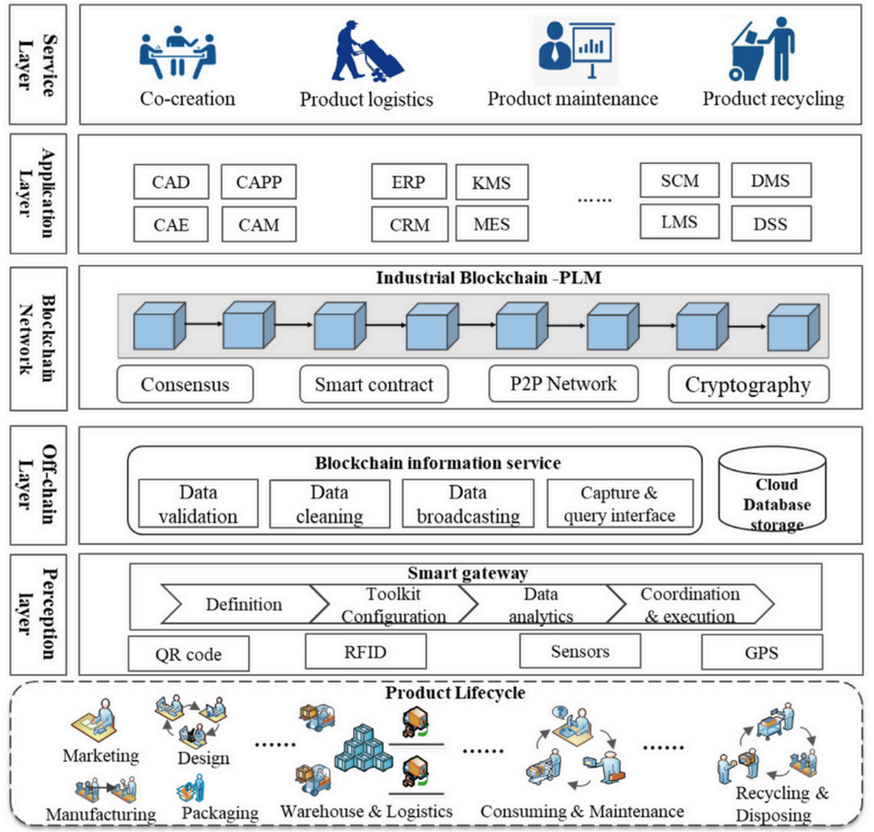

Fig. 1. The architecture of the proposed blockchain-based PLM.

Thank You for Listenning

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