HCL DEFINES SCALABLE & SECURE **IoT ARCHITECTURE** FOR A GLOBAL FOOD PROCESSING EQUIPMENT MANUFACTURER

CUSTOMER PROFILE

The customer is a global leader in food processing industry and a market leader in the supply of flour production plants, pasta, and chocolate production lines. It has a diversified portfolio of nutrition, die casting and optics businesses. The company strongly believes in using technology as an enabler and deploying it for creating sustainable and differentiated products/services. The organization recently launched a digital transformation initiative to create value-added services for its customers in the food and feed industry through innovative, customer-centric, and data-driven solutions.

CUSTOMER CHALLENGES

STRATEGIC CHALLENGES

a. Modernisation of the global production network and transitioning to Industry 4.0 technologies

b. Charting a roadmap for implementing IoT services and other digital technologies as future drivers of value for not only its customers but also for the end users

TACTICAL CHALLENGES

The customer had identified digitalization as a source of accelerated transformation. The customer has a diverse portfolio composed of nearly a dozen business areas with a global presence. It envisioned a common platform that standardizes the communication and unifies processes of a dozen business units. On top of this platform, they wanted to deploy services which would help them streamline their business process and generate value for both their customers and end customers.

OUR SOLUTION

IoT WoRKS™ by HCL emerged as their partner of choice because of the availability of specialized skill set required for the execution of their IoT strategy. IoT WoRKS™ by HCL had previously executed similar projects and has developed its own IPs which is on the track of being an industry-wide standard when it comes to building and handling a common data platform for enterprises with complex organizational structure.

The customer was looking for technological partners who could support them in its journey of digitalization by providing the following services:

- Contributing to the development of Core IoT Platform

- Development of Business Unit-specific applications on a cloud platform
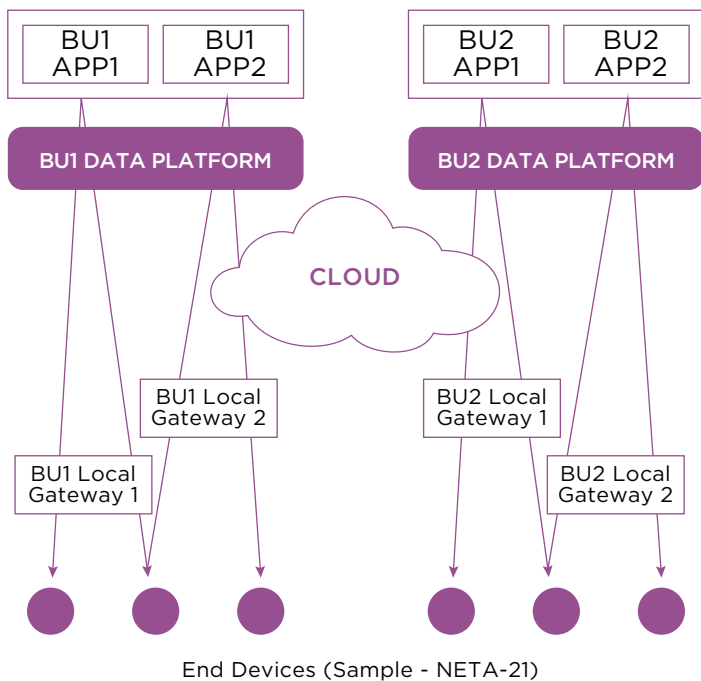
- Maintaining the digital platform
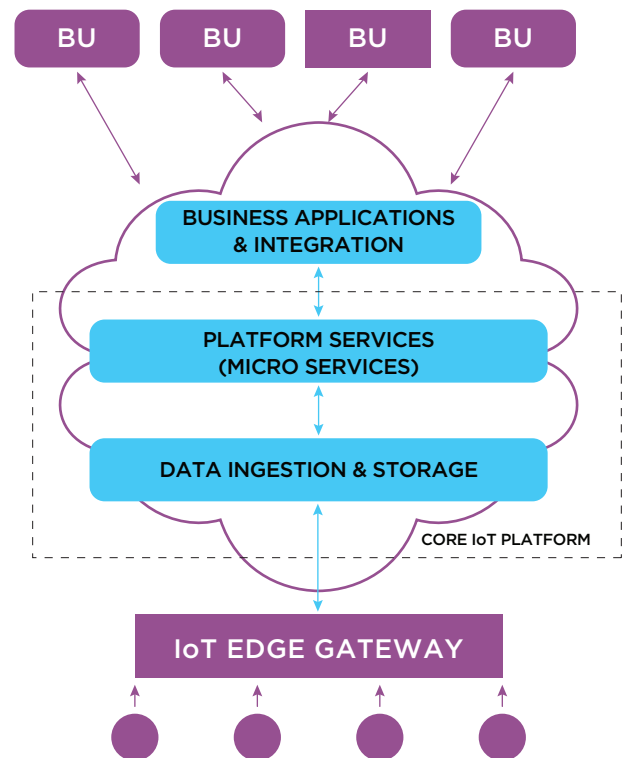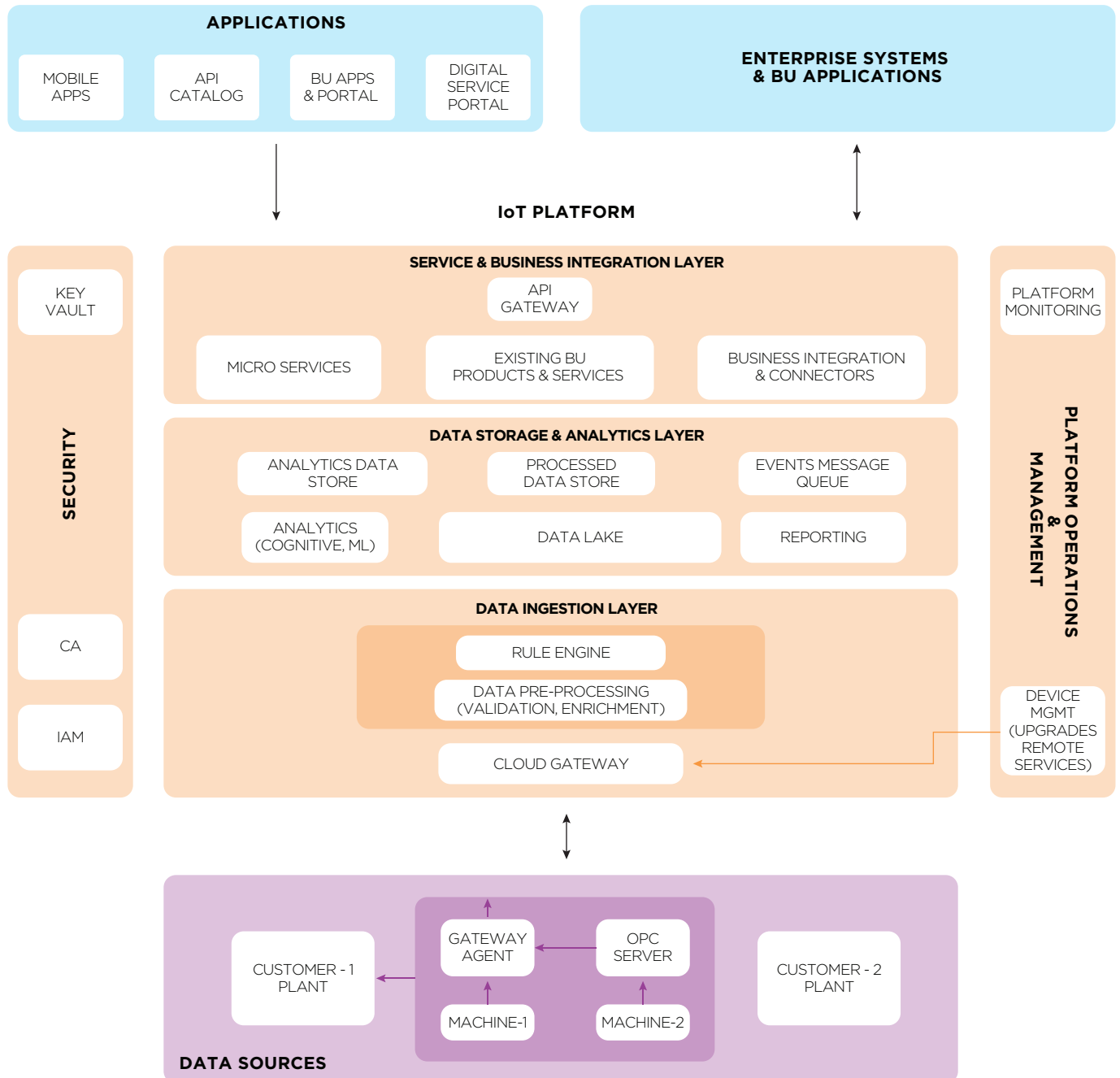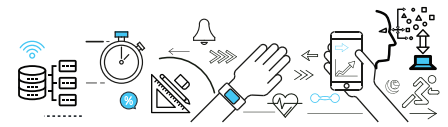

FIGURE 1: INITIAL STATE

FIGURE 2: CURRENT STATE

ARCHITECTURE OF THE IoT PLATFORM

IoT WoRKS™
by HCL Technologies

APPLICATIONS

| MOBILE APPS | API CATALOG | BU APPS & PORTAL | DIGITAL SERVICE PORTAL |

ENTERPRISE SYSTEMS & BU APPLICATIONS

IoT PLATFORM

SECURITY

| KEY VAULT |
| CA |
| IAM |

SERVICE & BUSINESS INTEGRATION LAYER

API GATEWAY

| MICRO SERVICES | EXISTING BU PRODUCTS & SERVICES | BUSINESS INTEGRATION & CONNECTORS |

DATA STORAGE & ANALYTICS LAYER

| ANALYTICS DATA STORE | PROCESSED DATA STORE | EVENTS MESSAGE QUEUE |
| ANALYTICS (COGNITIVE, ML) | DATA LAKE | REPORTING |

DATA INGESTION LAYER

RULE ENGINE

DATA PRE-PROCESSING (VALIDATION, ENRICHMENT)

CLOUD GATEWAY

PLATFORM OPERATIONS & MANAGEMENT

PLATFORM MONITORING

DEVICE MGMT (UPGRADES REMOTE SERVICES)

DATA SOURCES

| CUSTOMER - 1 PLANT | GATEWAY AGENT | OPC SERVER | CUSTOMER - 2 PLANT |
| | MACHINE-1 | MACHINE-2 | |

IoT WoRKS™ by HCL has come up with a scalable and secure architecture to meet the customer's requirement of onboarding multiple business lines and their applications on to the central platform. The architecture allows for the development of new core services that can be leveraged by multiple business lines as well as allow for creating business-specific applications, with security features embedded into all layers of IoT stack.

BUILDING CORE IoT PLATFORM

IoT WoRKS™ by HCL enabled two core services in the platform:

a. **Image Analytics:** This service provides the basic framework for the business-specific applications to perform image analytics and cognitive analysis. The service has been designed in such a way that the majority code can be reused. Thus, the code subjective to the use case of image analytics has to be rewritten.

b. **Data Ingestion Pipeline:** The data ingestion pipeline pre-processes the data as per the rules fed into the rule engine. It then stores the data for further analytics. Earlier, a higher pre-processing time was leading to slower response time for the end user. Thus, the data ingestion pipeline was redesigned and redeveloped by us. This reduced the time taken in pre-processing the data and quickly fed it to the rule engine. As a result, the end user did not experience any lags or delays in the response.

BUILDING BUSINESS-SPECIFIC APPLICATION

a. **Grain Quality Analyser:** The mobile application enabled our client's customers to get a quality report of grains digitally, eliminating the manual process which was slow and prone to errors. This application utilizes the Image Analytics service on the core platform built by IoT WoRKS™ by HCL.

b. **Die Quality Analyser and Maintenance Scheduler:** Quality of the die used by our client's customers determined the quality of their production, making the periodic maintenance of the die necessary. The Die Quality Analyzer and Maintenance Scheduler empowered the user to quickly analyze problems and defects in the die and automatically schedule a maintenance job along with an auto-generated quotation. This application utilizes the image analytics services which is integrated with the CRM application situated on the IoT Platform.

MAINTAINING AND UPGRADING THE IoT PLATFORM AND ITS APPLICATIONS

IoT WoRKS™ by HCL is working with the client to add more capabilities to the Core IoT Platform and build newer, out-of-the-box business-specific mobile solutions. HCL also provides services and support to manage the applications developed for the client.

SALIENT FEATURES OF THE PLATFORM

Scalability: The Image Analytics service can be scaled to multiple applications with minimal changes to the platform and the IoT solution.
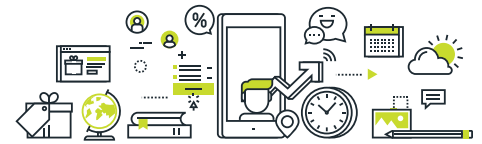
Security: The platform and applications deployed use secure data access APIs. This is achieved by tokenization within the APIs.

Resource Optimization: The application is designed in such a way that minimal cloud resources are used. This effective usage of resources leads to reduced cost for using the application.

CUSTOMER BENEFITS

With this IoT-led transformation, the client has been able to boost its bottom line. These savings are majorly driven by a drastic reduction in operating costs along with improvement in quality, productivity, and safety.

The Image Analytics capability deployed on the Core IoT Platform has facilitated multiple quality monitoring applications and has helped realize the following benefits:

Maximisation of yield

Increased quality control and traceability

Simplified processes with lesser turnaround time for maintenance jobs

Minimization of waste

Higher customer satisfaction with complete information visibility

The client has transformed these services into new revenue streams by selling these services on a subscription basis to its customers and end customers.

WHO ARE WE?

IoT WoRKS™ is a dedicated 'Internet of Things Business Unit' from HCL Technologies that enables organizations to create best-in-class solutions by enabling IoT-led transformation. These IoT solutions maximize effectiveness and returns on asset investments by creating efficient processes, new revenue streams and business models that deliver measurable outcomes. Recognized as a market leader in IoT by leading analyst firms, **IoT WoRKS™** continues to strengthen its leadership position in fast-growing global IoT services and consulting market.

We have a differentiated solution portfolio which aims to enable connected workforce, connected products, connected infrastructure, and connected operations for the Next Gen enterprises. With end-to-end IoT services for organizations across the three phases – **Define, Build & Run – IoT WoRKS™** helps design enterprise IoT strategy, develop and run the IoT systems for realizing real business value. Solving the eminent challenges in the industry today with research-led approach, **IoT WoRKS™** has launched a platform - **IoT COLLAB™** - the destination for IoT-led business transformation for the Next Gen enterprises to co-create transformational IoT roadmap and solutions with the customers.

We continue to develop best-in-class IoT frameworks, wider and more mature solution offerings across key IoT business segments, as well as strengthening the IoT ecosystem play with the right partnerships, and engage customers with innovative business models to drive the phenomenal business transformation opportunity.

Our IPs and Accelerators

DDX
Accelerator for device IoT-ization

PANGEA
Data Analytics platform

IDEA GATEWAY
Reference Design for an intelligent device

PLATFORM ACCELERATION SUITE
Build next generation cloud services

When You Start with a Top-rated Value Proposition, the Ratings Follow

LEADER
ISG Research Quadrant 2018 on IoT Services, Healthcare IoT, & Connected Cars for US Market

ISG

WINNER'S CIRCLE
2016 Blueprint Report on IoT

HfS

LEADER
Worldwide IoT Consulting & System Integration Services 2016

IDC MARKETSCAPE

LEADER
Zinnov Zones 2017 - Global IoT Technology Services consecutively for 2nd year

ZINNOV

LEADER
IoT Service PEAK Matrix™ Assessment 2017 consecutively for 2nd year

EVEREST GROUP

LEADER
Early Traction in Key Verticals for IoT WoRKS™ portfolio

451 Research

Visit **www.hcltech.com/iot** for more information

To collaborate over a complementary IoT roadmap workshop,
email us at **iotworks@hcl.com**

www.hcltech.com

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