

# ANALYTICAL INFORMATION IIOT SYSTEM

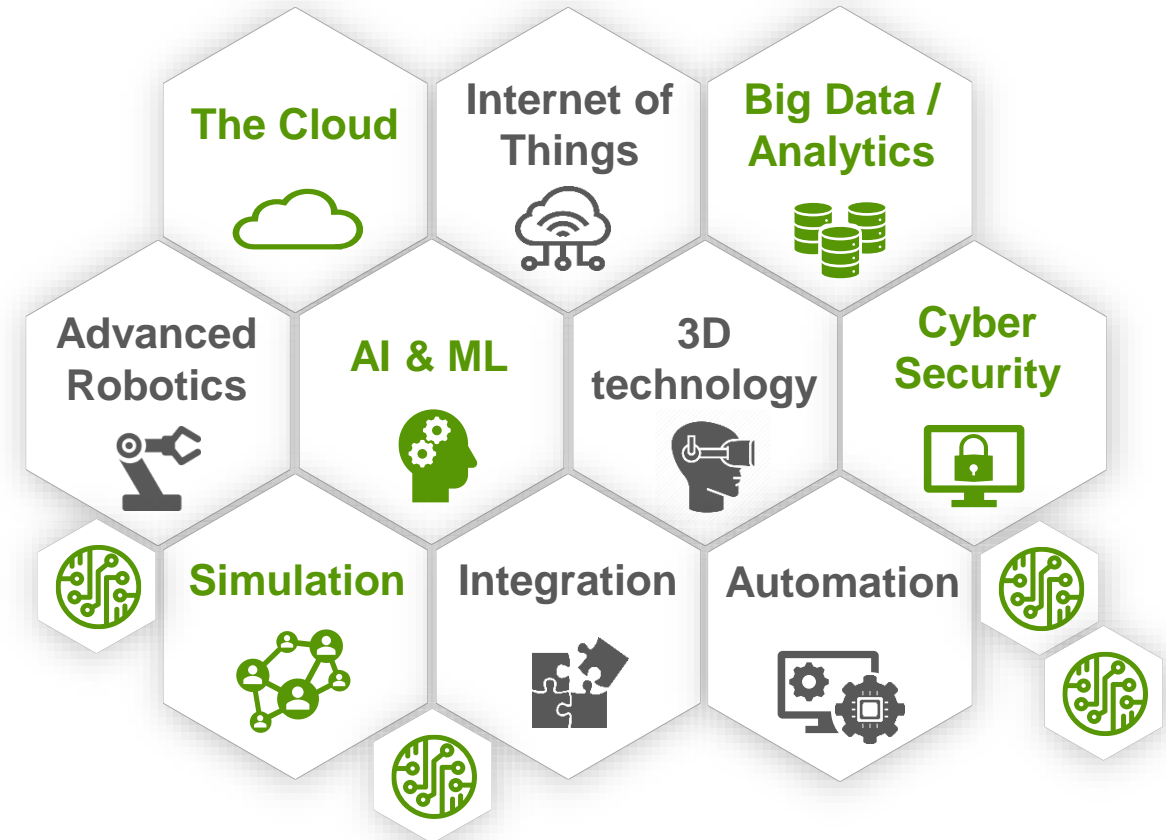


SAKURA-IIOT

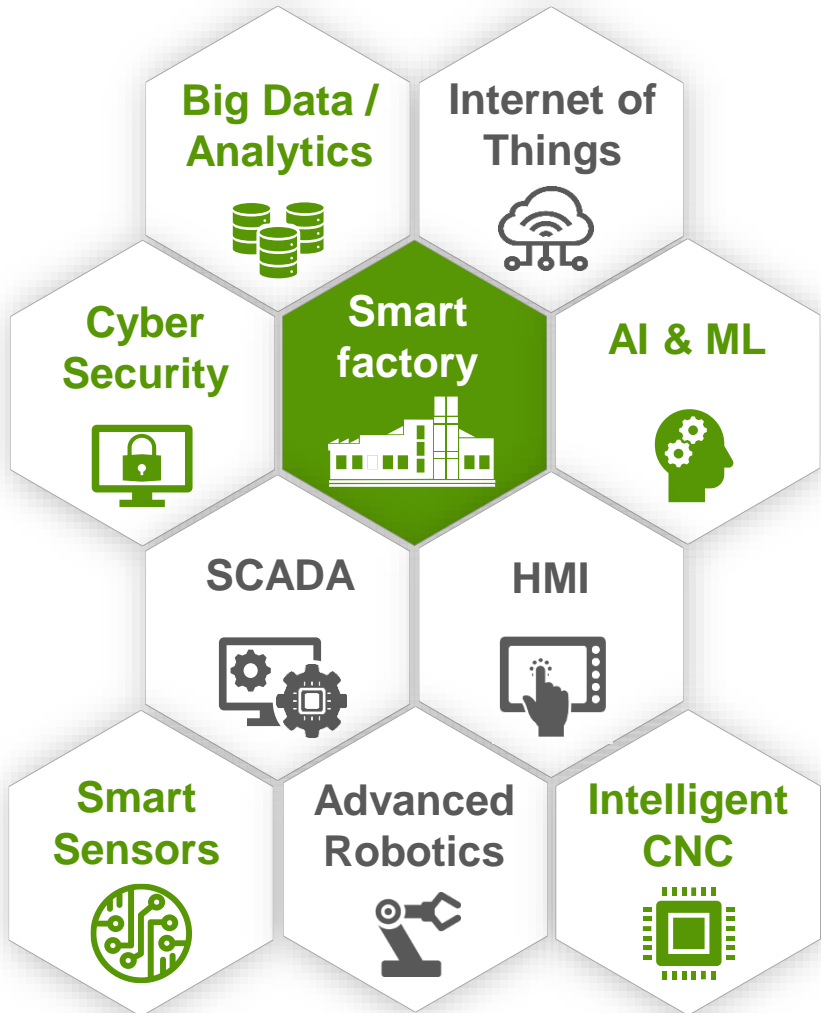
- ✓ Industry 4.0 is an urgent need of today, which guarantees financial success, development of technologies, real growth of production
- ✓ Industry 4.0 provides development and combination of automated production, data exchange and production technologies into a single self-regulatory system with minimal human intervention in production processes

### Main directions of development:

- ✓ Implementation of the Digital Double of the product creation
- ✓ Horizontal integration of productions and suppliers into a single information space
- ✓ Vertical integration of production systems



- ✓ A new level of organization and control of production processes at all stages of product creation
- ✓ Products (from semi-finished product to finished product) contain all information about the technology of its production
- ✓ Manufacturing of products is carried out by a network of cyber-physical systems, based on data extracted from a semi-finished product



Industry 4.0 is transforming businesses and should be part of the CEO's daily agenda

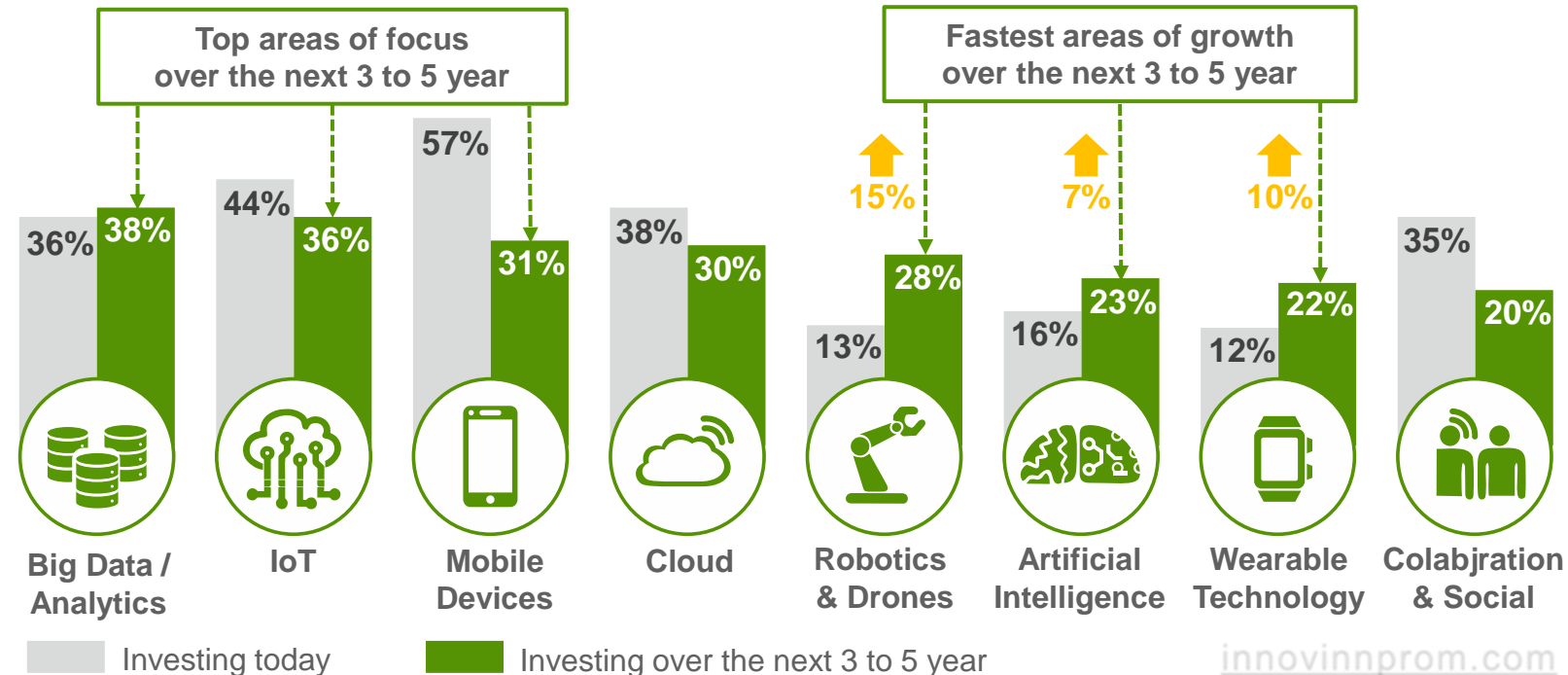
The results of research network of companies in the field of consulting and auditing PriceWaterhouseCooper (PWC):

Until 2025, European industry will invest around **€ 140 billion** in Industry 4.0 annually

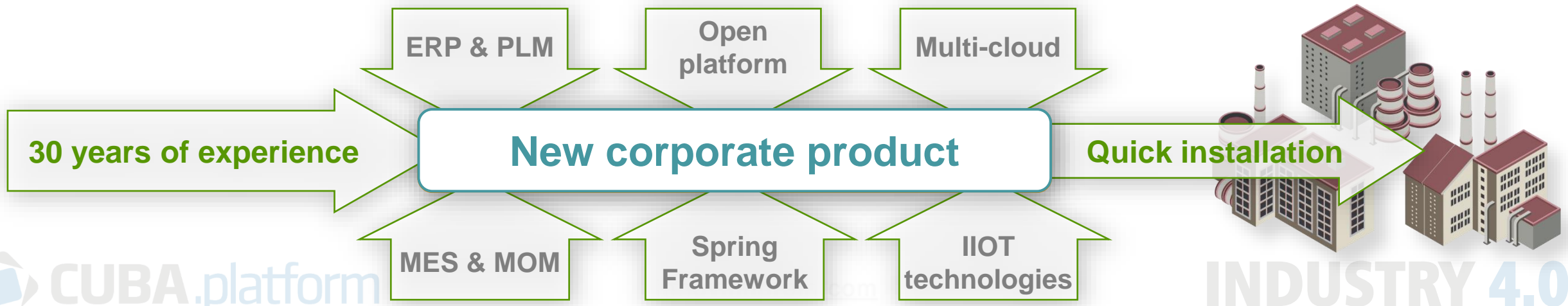
More than **80%** of enterprises, within 5 years, will digitize the entire product chain, including suppliers

By 2025, an **18%** increase in labor productivity is expected due to the introduction of the Industry 4.0 concept

Digital products and services generate around **€ 110 billion** in additional revenue for European industry annually

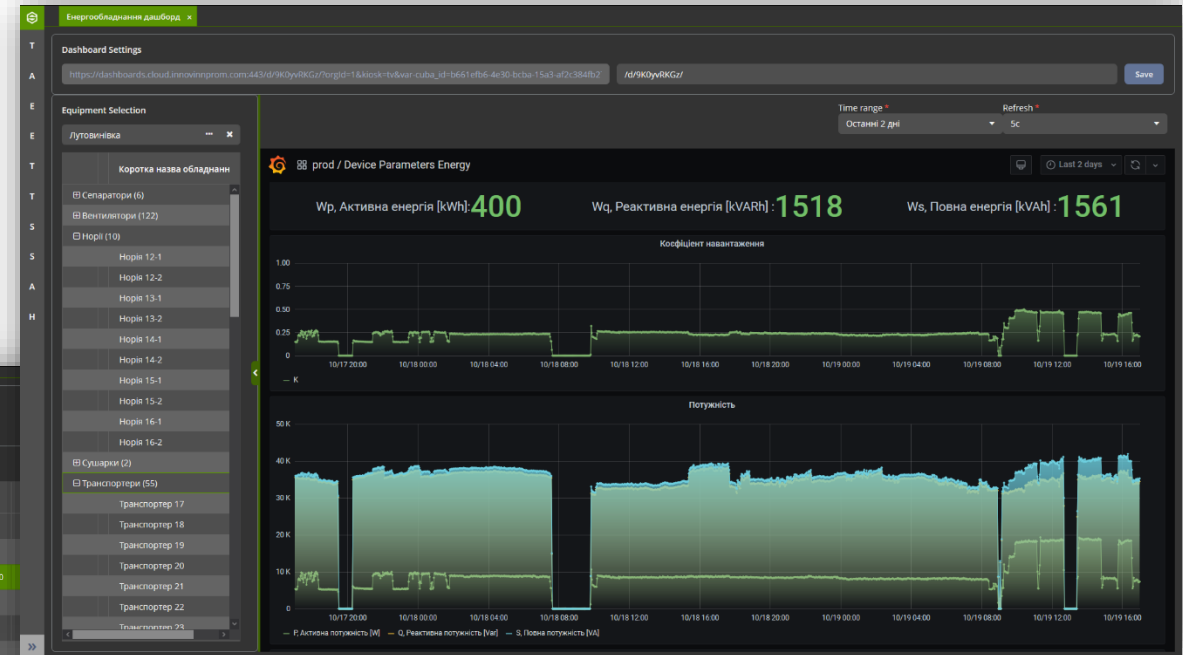
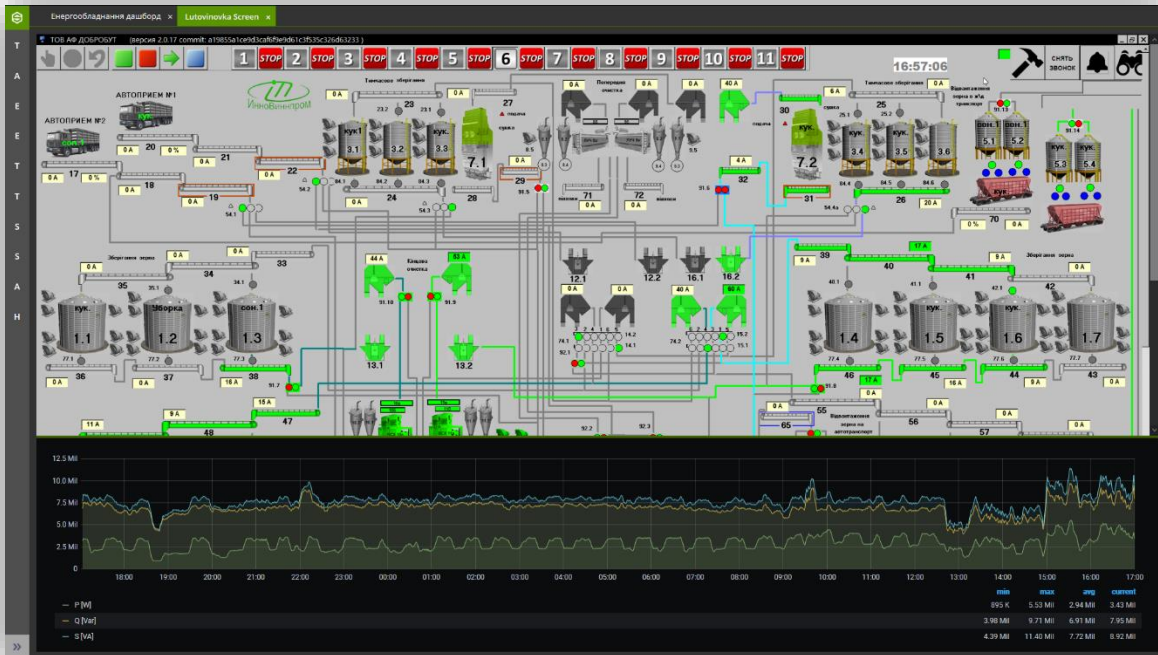


- 1** **Creating an alternative open source IIOT system**  
 that does not require licensing, works freely with a variety of databases, has a sufficient number of ready-made tabular and graphical forms for quick configuration of projects to customer needs
- 2** **Transfer of 30 years of experience of INNOVINNPROM LTD**  
 in creating information and analytical ERP and PLM systems and experience in integrated enterprise automation to a modern software base, the use of the most modern databases, computing and cloud solutions
- 3** **Combining data sets of MES and MOM systems with data sets of ERP and PLM systems**  
 into a single information space for the formation of analytical information that will provide a qualitative calculation of productivity and energy efficiency of production
- 4** **Ability to quickly create corporate projects**  
 by configuring ready-made computing software modules, visualization modules and databases without the involvement and training of highly specialized professionals and programmers





Guided by many years of experience in industrial automation and information technology and taking into account the main trends and requirements of the fourth industrial revolution Industry 4.0, INNOVINNPROM has developed **IIOT system SAKURA** - a modern industrial system of control, analysis and management of production and technological processes



Supervisor settings

Administration

Help

ID	Device	Location	Start Time	End Time	Status	Value 1	Value 2	Value 3	More info				
8	Сушилка В 7.2	Бункер ВУ 1.6	19/10/2020 11:10		Невизначено				More info				
7	Бункер НУ 2.1	Бункер ВУ 4.2	19/10/2020 10:52	0:13	Невизначено				More info				
10	2	Бункер НУ 1.6	Бункер ВУ 5.4	19/10/2020 09:29	2:0	19/10/2020 09:42	1:11	0:12	Невизначено	6,376	10,309	11,835	More info
7	1	Бункер НУ 2.1	Бункер ВУ 5.1	19/10/2020 08:40	0:14				Невизначено				More info
9	2	Бункер НУ	Сушилка ВУ 7.2	18/10/2020 23:58	0:13				Невизначено				More info
8	2	Сушилка ВУ 7.2	Бункер ВУ 1.6	18/10/2020 22:11	0:22				Невизначено				More info
8	1	Сушилка ВУ 7.2	Бункер ВУ 1.6	18/10/2020 18:49	0:14				Невизначено				More info
6	4	Бункер НУ 1.3	Бункер ВУ 2.1	18/10/2020 09:48	2:2				Невизначено				More info
9	1	Бункер НУ	Сушилка ВУ 7.2	18/10/2020 09:45					Невизначено				More info
8	1	Сушилка НУ 7.2	Бункер ВУ 1.6	18/10/2020 09:37	1:9				Невизначено				More info
6	4	Бункер НУ 1.3	Бункер ВУ 2.1	18/10/2020 01:47	0:23	18/10/2020 07:37	1:15	5:50	Невизначено	152,791	498,461	512,357	More info
7	4	Бункер НУ 2.3	Бункер ВУ 2.1	17/10/2020 20:16	2:11				Невизначено				More info
1	2	АВТОПРИЕМ №1	Бункер ВУ 3.6	17/10/2020 15:50	1:11	17/10/2020 16:57	0:45	1:7	Невизначено	0	0	0	More info

GMT-03:00

Administrator

Industrial Internet of Things (IIOT) system SAKURA-IIOT – industrial analytical processing system that is designed to control and manage all production and technological processes in industrial enterprises

SAKURA-IIOT has built-in elements of artificial intelligence and performs self-regulation functions to optimize the financial costs of the enterprise by optimizing mutually integrated production and technological processes and reducing the role of the human factor. SAKURA-IIOT contains two subsystems :



## ERP PLM system of quantitative and qualitative accounting of products SAKURA-Production

SAKURA-P provides horizontal integration of production and suppliers into a single information space and is responsible for obtaining information about the work of enterprises, planning, operational control and management of material resources



## Technological cost control system SAKURA-Technology

SAKURA-T provides vertical integration of production systems and is responsible for control of technological processes at the enterprises (enterprise), control and analysis of energy consumption, control and analysis of efficiency of the equipment use by the enterprises and control of production processes' productivity



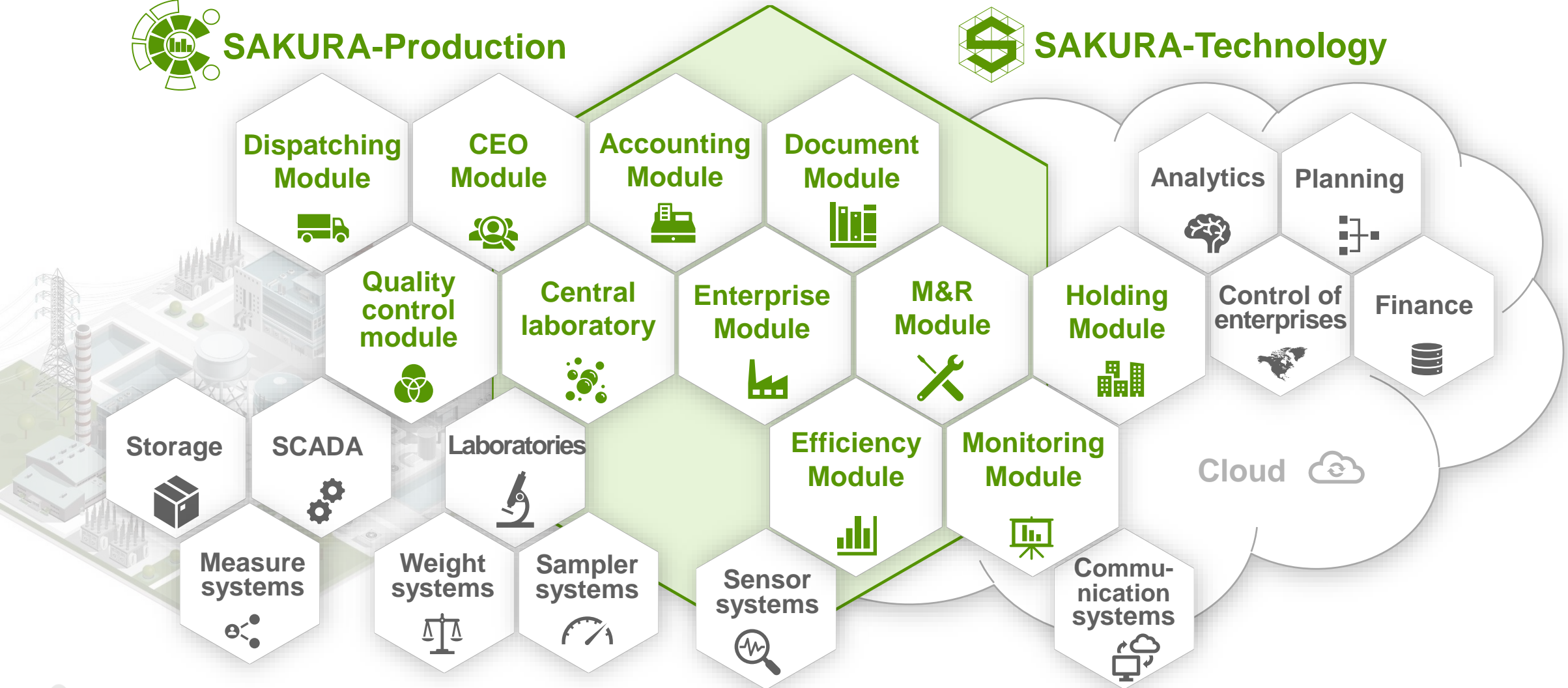
SAKURA-IIOT has a modular structure. The customer receives the basic modules and modules that he needs. During application, the system architecture can be adjusted.



## SAKURA-Production



## SAKURA-Technology



**EMI**  
Enterprise  
Manufacturing  
Intelligence

**PLM**  
Product  
Lifecycle  
Management

**ERP**  
Enterprise  
Resource  
Planning

**MES**  
Manufacturing  
Execution  
System

**Cloud**

**MOM**  
Manufacturing  
Operations  
Management

**TIA**  
Totally  
Integrated  
Automation

## SAKURA-TECHNOLOGY



Control of enterprises



Analytics



Planning



Maintenance



Energy  
efficiency



Energy control



IIoT gateways

**APS**  
Advanced  
Planning &  
Scheduling



Analytics



Planning

## SAKURA-PRODUCTION



Registration



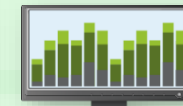
Raw materials  
laboratory



Technological  
laboratory



Central  
laboratory



Silo board



Quantitative &  
accounting



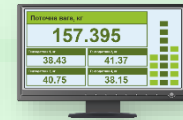
Accounting



Dispatching  
department



Automobile  
weight



Railway  
weights



Samplers



Raw materials  
storage



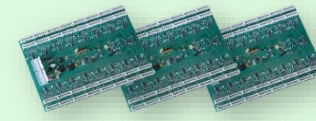
Finished  
products storage

## SCADA



PLC

## Measurement



Controllers & Sensors

## Sampler systems



Samplers

## Weight systems



Weights





## SAKURA-IIOT

Configurable on the basis of an open source Java platform



Packed in clusters of K8s



Clusters are hosted in the cloud service



No licenses



Open languages



Template library





SAKURA-IIOT is implemented on the basis of a high-level open source Java platform for creating corporate information systems, as well as the server part of portals and mobile applications **CUBA-platform**

SAKURA-IIOT has a scalable modular architecture based on popular frameworks, designed to work in any environment

The SAKURA-IIOT architecture can be integrated into the cloud services of the world's leading providers selected by the customer and effectively use the storage, backup protection, data processing and computing capabilities guaranteed by these services

In addition, SAKURA-IIOT modules such as databases and application databases are arranged in Kubernetes (K8s) clusters

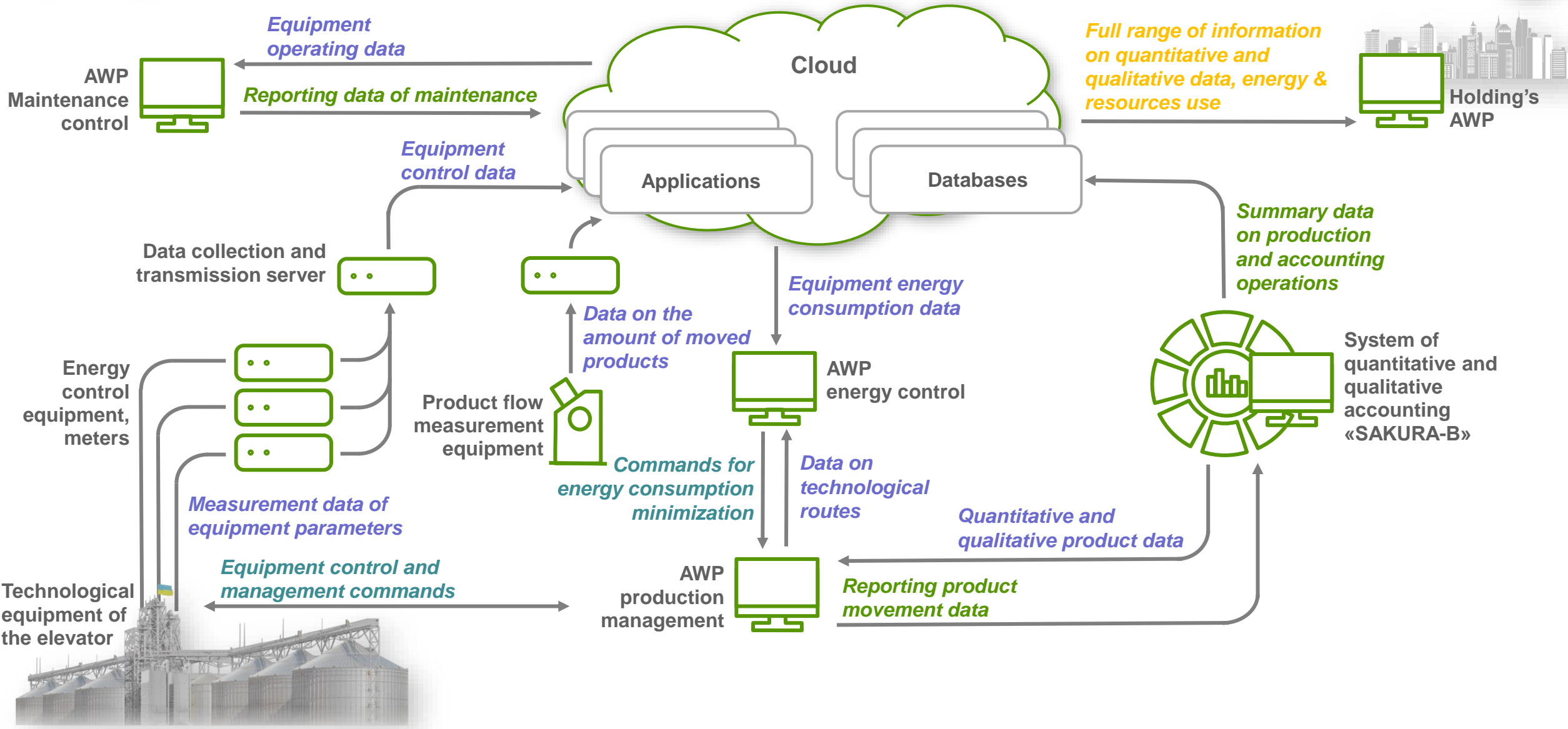




The most modern solutions of the world's leading IT companies were used in the development of SAKURA-IIOT



-  Google Cloud
-  Microsoft Azure
-  amazon web services
-  kubernetes
-  HAULMONT
-  CUBA.platform
-  spring
-  IntelliJ IDEA
-  Java
-  influxdb
-  chronograf
-  Grafana Labs
-  PostgreSQL
-  HA PROXY
-  PATRONI
-  APACHE HTTP SERVER PROJECT
-  Apache Guacamole™
-  UltraVNC



SAKURA-IIOT works in any customer-friendly browser on any operating system. To enter SAKURA-IIOT, simply enter the Internet address in the corresponding browser menu. Access to SAKURA-IIOT is provided on the basis of login and password

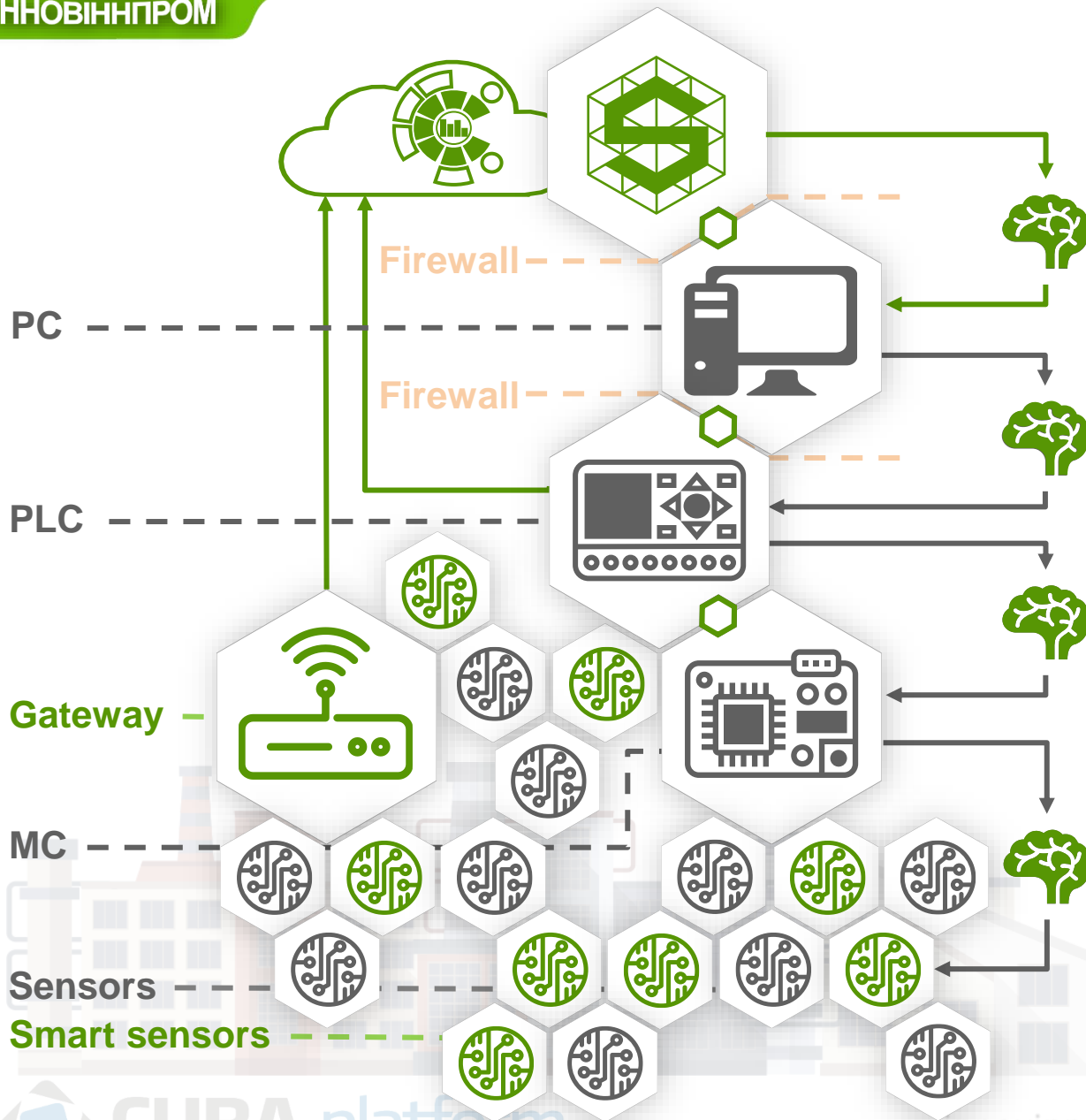


The configuration of SAKURA-IIOT windows and pages, access rights, staff roles are determined at the stages of terms of reference and system configuration, but staff are given the opportunity to adapt the display of data in a convenient form for personal perception

SAKURA-IIOT has a large set of ready-made forms, modules, tables, graphs, charts and therefore customizing the system to the needs of the customer is reduced to configuration and adaptation for a specific application and does not take much time and resources

Thanks to the integration of SAKURA-IIOT into cloud services of the world's leading cloud service providers has virtually unlimited resources for storage, processing, analysis and visualization of large amounts of data





SAKURA-IOT supports Artificial Intelligence and Machine Learning technologies.

SAKURA-IOT adjustment principles are based on strict adherence to SCADA's multi-level industrial architecture:

1. Hardware microcontrollers and built-in sensor microcontrollers are responsible for adapting and configuring intelligent sensors;
2. Control and management of equipment microcontrollers is performed by programmable logic controllers (PLC);
3. Control and management of PLC is carried out by SCADA
4. SAKURA-IOT on the basis of data array processing makes general adjustments at each level of management

Additional sensors and gateways are installed to obtain the most complete information about the system operation. They provide data transfer directly to SAKURA-IOT cloud services.

SAKURA-IIOT marketplace contains a rich collection of ready-to-use add-ons that cover all typical requirements for business applications and can be enabled with a mouse click – components, containers, dialogs and notifications, charts, pivot tables, maps, predefined styles



The collage displays a wide variety of UI components and data visualization tools:

- Buttons:** Action style buttons (primary, friendly, danger).
- Containers:** CSSLayout, v-component-group, SplitPanel, Large divider style.
- Text Elements:** Labels with font variants (light, bold, colored) and headers (h1, h2, h3, H4).
- Tables:** Multiple table styles including 'Table with style provider', 'Table with aggregation', 'Table with generated columns', and 'Table with EnterPress actions'.
 

Name	Last Name	Age	Active	Grade
Katherine	Potter	34	<input checked="" type="checkbox"/>	High
John	Doe	39	<input type="checkbox"/>	Standard
Andy	Lewis	35	<input type="checkbox"/>	Standard
Edward	Harris	27	<input checked="" type="checkbox"/>	Standard
- Charts and Graphs:** Multiple Data Sets, Stock Events, Multiple Panels, Intraday Data, Drawing Trend, Column Chart, Line Chart, XY Chart, Angular Gauge Chart, Angular With Two Axes, Solid Gauge Chart, Stacked Area, Stacked Column, Clustered bar, Column with Line, 3D Column, Multiple ValueAxis, Chart Click Events, Graph Click Events, Chart Slice Events, Gantt Chart with dates.
- Form Elements:** DateField, ProgressBar, TextField, Button, Tab, GroupTable.



**Real-time control** of technological processes in production in any industry. Based on the analysis of large amounts of data, optimization of technological settings and delays in the formation of recommendations for improving production productivity



**Calculation and analysis of energy efficiency** of equipment, technological operations and production in general, the formation of summary and comparative graphs and tables of energy efficiency for selected periods of time and in different modes of operation



**Control of personnel work**, blocking and prevention of mistakes and emergency situations. Control and analysis of personnel productivity separately, in shifts. Planning production changes and controlling the placement of personnel in accordance with the level of training



**Planning and control of maintenance and repair of equipment.** Accounting for operating and consumption of energy resources by equipment. Accounting and planning the use of spare parts and materials during maintenance and repairs





**The Holding module** provides display of generalized, comparative, concretized and analytical information coming from the holding companies



The main types of information are information on the quantity and quality of products, energy consumption and energy efficiency of technological operations at the holding's enterprises

**The Enterprise module** provides display of generalized, comparative, concretized and analytical information at the enterprise



The main types of information are information on the quantity and quality of products, energy consumption and energy efficiency of technological operations

**The Maintenance and repair module (M&R)** provides planning and control of maintenance and repairs at the holding companies



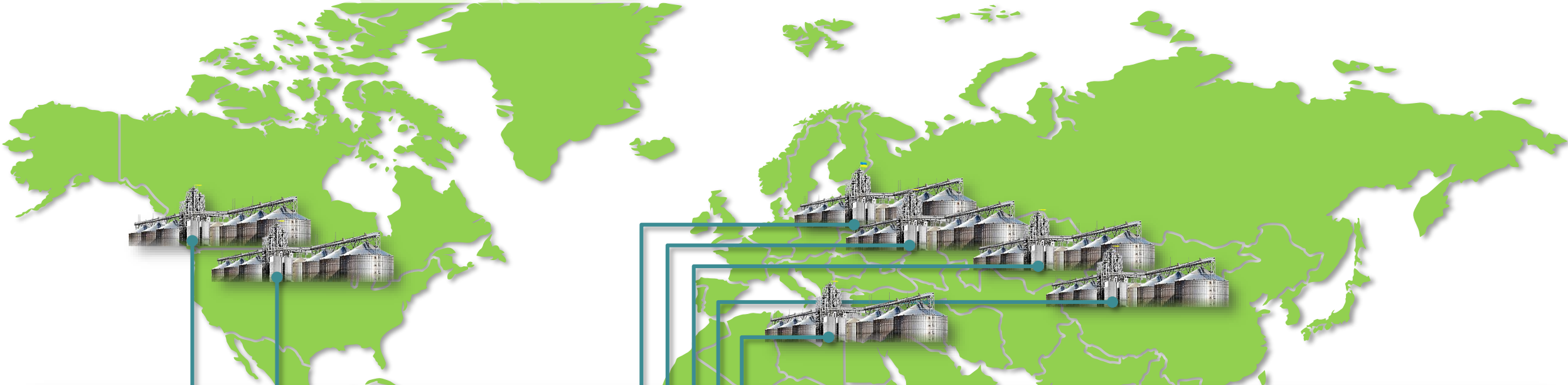
The main types of information are information on the operation of equipment, energy consumption, use of spare parts and materials during maintenance and repairs

**The Energy Efficiency module** provides measured and analytical information on the consumption of the main types of energy by each unit of equipment, technological group and the enterprise as a whole.



Based on the obtained data, the calculation of energy efficiency of equipment and technological operations is performed

## Control of the holding's enterprises



SAKURA-T

Типи обладнання × Обладнання × Підприємства × Туре Grain Crop × Entry Inspector × Маршрути історія × Історія обладнання × Силосна дошка × Equipment Dashboard × Lutovynivka Screen ×

Application

Тип обладнання  
Обладнання  
Підприємства  
Довідник культур  
Енергія  
Енергообладнання  
Дашборд обладнання  
Supervisor  
Lutovynivka Screen  
Технологія  
Маршрути історія  
Історія обладнання  
Силосна дошка  
ТОП

Витівці	Красилів	Лутувинівка	Семенівка
Споживання електроенергії 4536,25 кВт	Споживання електроенергії 1846,3 кВт	Споживання електроенергії 968,17 кВт	Споживання електроенергії 1536,25 кВт
Споживання газу 451,5 м3/год	Споживання газу 200,25 м3/год	Споживання газу 0 м3/год	Споживання газу 400,17 м3/год
Енергоефективність 0,84	Енергоефективність 0,78	Енергоефективність 0,69	Енергоефективність 0,82

Скороходово	Хмільник	Яреськи	Вінниця
Споживання електроенергії 1521,8 кВт	Споживання електроенергії 2431,64 кВт	Споживання електроенергії 968,85 кВт	Споживання електроенергії 1221,37 кВт
Споживання газу 120,25 м3/год	Споживання газу 136,12 м3/год	Споживання газу 0 м3/год	Споживання газу 350,16 м3/год
Енергоефективність 0,67	Енергоефективність 0,74	Енергоефективність 0,68	Енергоефективність 0,73

Ma	Var	Із	До	Запуск	Трив	Зупинка	Трив	Час р	Операція	Культура	Вага	WP	WQ	WS	Енергоефективність	Детальна Інфор
2	2	АВТОПРИЕМ №2	БункерВУ 2.1	20/11/2020 10:54	0:00	20/11/2020 11:07	0:58	0:12		Невизначено	0	3,343	10,549	13,433	0,0	<a href="#">More info</a>
1	2	АВТОПРИЕМ №1	БункерВУ 3.6	20/11/2020 10:42	1:8	20/11/2020 11:07	0:44	0:24		Невизначено	0	7,564	22,193	24,344	0,0	<a href="#">More info</a>
7	4	БункерВУ 2.1	БункерВУ 2.4	20/11/2020 06:20	2:9	20/11/2020 10:09	1:19	3:49		Невизначено	0	165,904	370,382	379,568	0,0	<a href="#">More info</a>
1	2	АВТОПРИЕМ №1	БункерВУ 3.6	19/11/2020 17:30	1:8	19/11/2020 18:20	0:44	0:50		Невизначено	17,050	32,640	47,693	60,513	0,02	<a href="#">More info</a>
1	2	АВТОПРИЕМ №1	БункерВУ 3.6	19/11/2020 13:40	0:00	19/11/2020 13:55	0:44	0:15		Невизначено	4,500	5,850	13,524	15,350	0,0	<a href="#">More info</a>

Refresh Excel Перехувати енергію

SAKURA-T

Типи обладнання × Обладнання × Підприємства × Туре Grain Crop × Entry Inspector × Маршрути історія × Історія обладнання × Силосна дошка × Equipment Dashboard × Lutovynivka Screen ×

Application

Тип обладнання  
Обладнання  
Підприємства  
Довідник культур  
Енергія  
Енергообладнання  
Дашборд обладнання  
Supervisor  
Lutovynivka Screen  
Технологія  
Маршрути історія  
Історія обладнання  
Силосна дошка  
ТОП

From 02/11/2020 00:00 To 03/11/2020 00:00 Apply Власний діагност Refresh off

The Enterprise module provides the collection and display of generalized, comparative, specific and analytical information in the enterprise. The module analyzes the productivity of technological processes and forms commands for its optimization.

The screenshot displays the SAKURA-T Enterprise Module interface, which is divided into several functional areas:

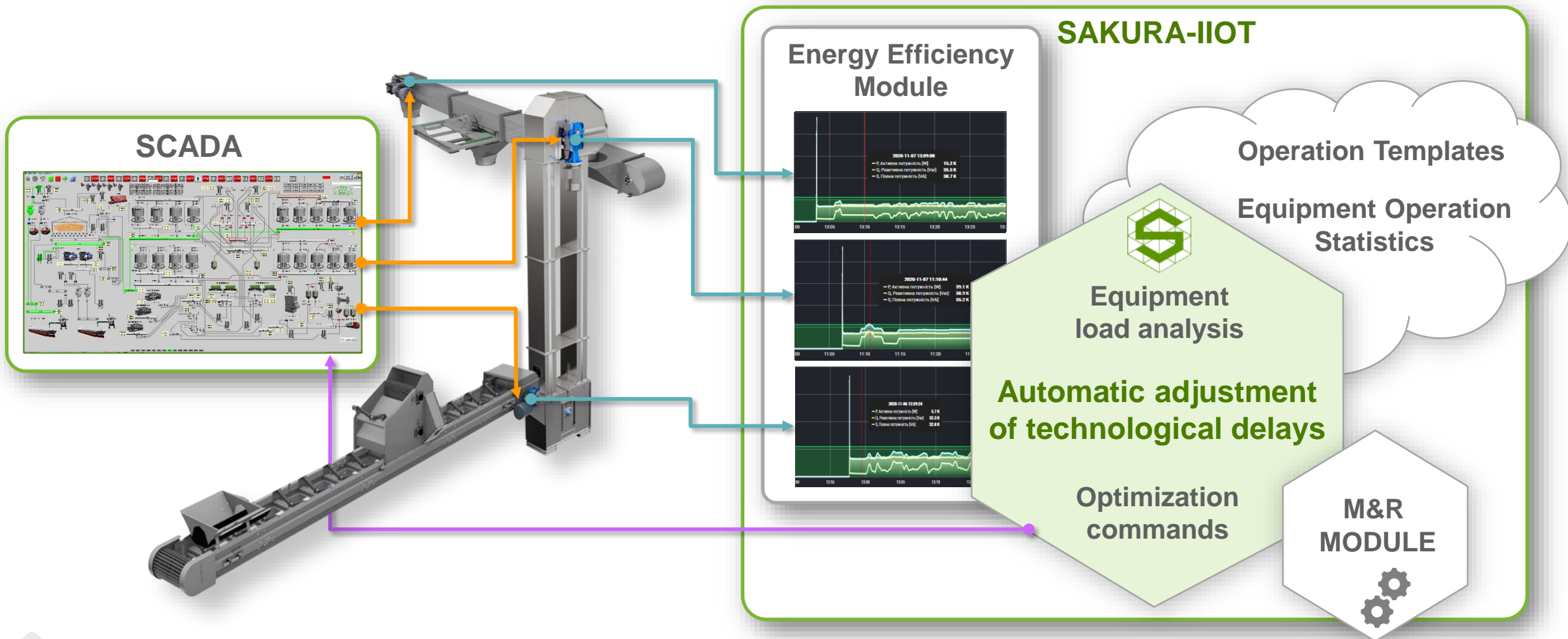
- Equipment Dashboard:** A central panel showing a detailed process flow diagram with various equipment units (e.g., 1.1, 1.2, 1.3) and their operational status.
- Energy Monitoring:** A panel displaying real-time energy metrics:
  - Wp, Активна енергія [kWh]: 130
  - Wq, Реактивна енергія [kVARh]: 263
  - Ws, Повна енергія [kVAh]: 295
- Equipment Selection:** A sidebar menu for selecting specific equipment, such as "Норія 13-2" (Elevator 13-2).
- Energy Efficiency Graphs:** Two line graphs showing "Коефіцієнт навантаження" (Load coefficient) and "Потужність" (Power) over time.
- Power Graphs:** A graph showing "Активна потужність [W]", "Реактивна потужність [VA]", and "Повна потужність [VA]" over time.
- Equipment Dashboard (Detailed):** A panel showing a list of equipment with their status and energy consumption data.
- Energy Efficiency Table:** A table with 544 rows showing energy efficiency data for different equipment and processes.
 

№	Вид	Із	До	Запуск	Трив	Ефективність	Трив	Час р	Операції	Культура	Вага	WP	WQ	WS	Енергоєфективність
2	2	АВТОПРИЄМ №2	БункерВУ 2.1	20/11/2020 10:54	1:14	20/11/2020 11:07	0:58	0:12	Невизначено	0	3,343	10,549	13,433	0.0	
1	2	АВТОПРИЄМ №1	БункерВУ 3.6	20/11/2020 10:42	1:0	20/11/2020 11:07	0:46	0:24	Невизначено	0	7,564	22,193	24,344	0.0	
7	4	БункерВУ 2.1	БункерВУ 2.4	20/11/2020 06:20	2:9	20/11/2020 10:09	1:19	3:49	Невизначено	0	165,904	370,382	379,568	0.0	
1	2	АВТОПРИЄМ №1	БункерВУ 3.6	19/11/2020 17:30	1:0	19/11/2020 18:20	0:46	0:50	Невизначено	17,050	32,640	47,693	60,613	0.0	
- Equipment Dashboard (Detailed):** A panel showing a bar chart of "Заповненість Бункерів(тис. Тон)" (Bin capacity in thousands of tons) and a pie chart showing the distribution of equipment types.
- Energy Efficiency Table (Detailed):** A table with 150 rows showing detailed energy efficiency data for different equipment and processes.
 

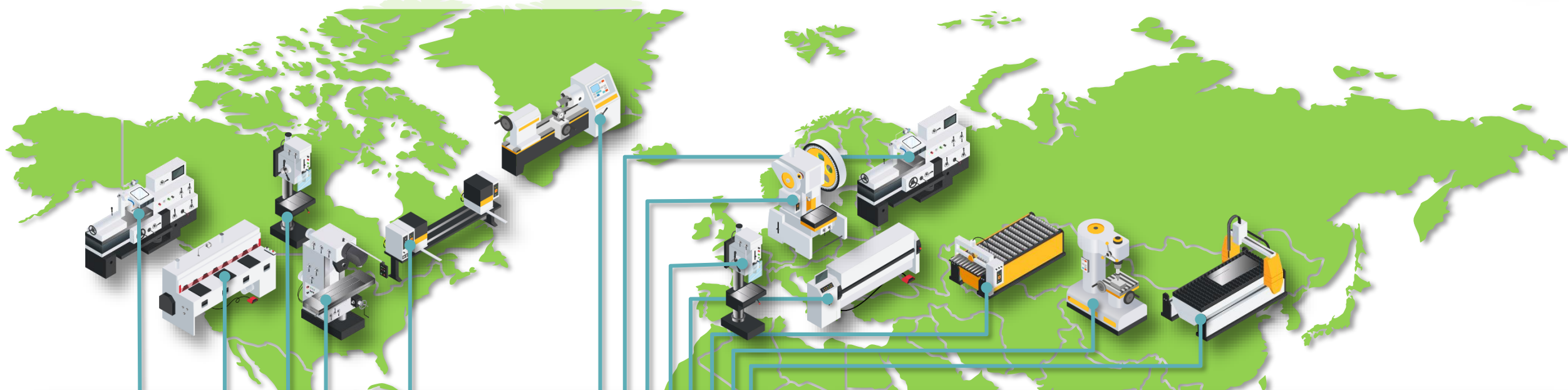
Запуск	Місце зберігання	Культура	Вага	Натура г/л	Скоро-добіч. %	Вологість %	Сміття %	Ефект %	Клейковина %	Падання %
20/11/2020 11:21	БункерВУ 2.4	Невизначено	867	48	13.1	0.1	9.4	2.4	229	
20/11/2020 10:54	БункерВУ 2.1	Невизначено	988	43	11.6	0.5	9.8	2.5	217	
20/11/2020 10:42	БункерВУ 3.6	Невизначено	991	49	11.6	0.9	10.2	1.5	204	
20/11/2020 06:20	БункерВУ 2.4	Невизначено	814	47	9.7	0.6	11.6	1.9	193	
19/11/2020 17:30	БункерВУ 3.6	Невизначено	17,050	994	45	12.4	1.0	9.8	2.5	194
19/11/2020 13:40	БункерВУ 3.6	Невизначено	4,500	912	42	13.8	0.8	10.0	1.8	199
19/11/2020 13:11	БункерВУ 3.6	Невизначено	830	47	12.0	0.6	10.6	2.4	213	
19/11/2020 11:10	БункерВУ 2.4	Невизначено	914	43	13.1	0.7	10.2	2.3	197	
19/11/2020 09:53	БункерВУ 3.6	Невизначено	12,450	859	46	12.7	0.1	10.5	1.9	201
19/11/2020 06:18	БункерВУ 2.4	Невизначено	922	40	10.0	0.6	10.3	2.2	229	

SAKURA-IIOT monitors the equipment load and automatically optimizes technological operations based on an array of statistics.

It provides an increase in energy efficiency and productivity.



## Control of machine tools and planning of their maintenance by the manufacturer



SAKURA-T Register/Order browser - Tool/Equipment browser

Equipment info

ID equipment	Name equipment type	Mark equipment	Factory number	Factory producer	Short name enterprise	Technological number	Put in operation	Counter total	Counter type	Condition equipment
1	Noria	FUT	456	Snele	Agro-PP	123	07/10/2020	450	hour	OK

Maintenance and operation

Date	Time	Value	Unit
20/11/2020	06:20	2.9	h
19/11/2020	17:30	1.9	h
19/11/2020	13:40	0.9	h
19/11/2020	09:53	1.9	h
19/11/2020	13:11	1.9	h
19/11/2020	11:10	2.10	h
19/11/2020	09:53	1.9	h
19/11/2020	06:18	2.9	h
18/11/2020	17:04	1.9	h
18/11/2020	14:25	1.9	h
18/11/2020	11:06	2.9	h
18/11/2020	06:18	2.9	h
18/11/2020	17:04	1.9	h
18/11/2020	14:25	1.9	h
18/11/2020	11:06	2.9	h
18/11/2020	06:18	2.9	h
17/11/2020	17:17	1.9	h
17/11/2020	14:38	0.9	h
17/11/2020	14:38	0.9	h
17/11/2020	14:38	0.9	h
17/11/2020	14:38	0.9	h
17/11/2020	14:28	0.9	h
18/11/2020	06:18	2.9	h
17/11/2020	17:17	1.9	h
17/11/2020	14:38	0.9	h
17/11/2020	14:38	0.9	h
17/11/2020	14:28	0.9	h

SAKURA-T Register/Order browser - Tool/Equipment browser

Equipment info

ID equipment	Name equipment type	Mark equipment	Factory number	Factory producer	Short name enterprise	Technological number	Put in operation	Counter total	Counter type	Condition equipment
1	Noria	FUT	456	Snele	Agro-PP	123	07/10/2020	450	hour	OK

Parent equipment info

ID equipment	Technological number	Factory number	Counter total	Counter type	Condition equipment	Factory producer	Mc
1	123	456	450	hour	OK	Snele	1.9
23	2710/2020	1	2710/2020				1.9
55	Operating instructions	1	13/10/2020				1.9

Technical documentation

ID	Name technical documentation	Version	Date create technical documentation	downloadTechnicalDocumentation
23	Installation instructions	1	27/10/2020	Download
55	Operating instructions	1	13/10/2020	Download

Graphical data visualization showing a waveform plot over time.

ID document	Periodicity, months	Periodicity, hours	Duration, hours	Amount worker	Defect description	Summary works
1						
23						
55						

The Energy Efficiency module provides measured and analytical information on the consumption of basic energy sources by equipment, technological group, enterprise as a whole and generates data on the efficiency of technological operations

The module provides measurement and analysis of active, reactive and total values of current, voltage, power and energy

The module calculates and analyzes the energy efficiency of technological operations and informs about reaching the limit values

The energy efficiency factor is the amount of energy used to manufacturing and processing a ton of product



The Maintenance and Repair (M&R) module provides planning and control of equipment maintenance and repairs. The main types of information are information on the operation of equipment, its energy consumption, use of spare parts and materials during maintenance and repairs

The basis of the module is a schedule of maintenance and repairs, which reflects the planned activities and the results of their implementation

The module operates with equipment cards, which carry information about the assembly and condition of the equipment

The M&R module receives information on the operation of the equipment and its modes of operation from the Energy Efficiency module



The screenshot displays the SAKURA-T software interface with several active windows:

- Register Defects browser:** A table listing defects with columns: Id document, Toir equipment, Registered task, Unit crash, Detection date, Initiator worker, Contact worker, Unit performer, Toir equipment crash, Type problem, Type criticality, Type cause defect, Description defect, and List works. Two rows of data are visible.
- Register Tasks browser:** A table listing tasks with columns: Id equipment, Name equipment type, Mark equipment, Factory number, Factory producer, Short name enterprise, Technological number, Put in operation, Counter total, Counter type, and Condition equipment. One row of data is visible.
- Equipment info browser:** A section for technical documentation with columns: Id, Name technical documentation, Versior, Date create technical documentation, and downloadTechnicalDocumentation. Two rows of data are visible.
- Energy Consumption Chart:** A line graph showing energy consumption over time with three data series: P. Активная мощность [W], Q. Реактивная мощность [Var], and S. Полная мощность [VA].
- Equipment 3D Model:** A 3D rendering of a lathe machine.
- Defect Log Table:** A table showing defect details with columns: Id document, Periodicity, months, Periodicity, hours, Duration, hours, Amount worker, Defect description, and Summary works. Multiple rows of data are visible.

SAKURA-IIOT reads data from the equipment and / or software available at the facility, without interfering with the technological process

To ensure maximum data volume, additional IoT gateways are installed directly to cloud services

To measure energy parameters, specialized measuring equipment and energy meters are installed

The larger the volume and completeness of the data that SAKURA-IIOT receives, the better the calculation of processes productivity and efficiency



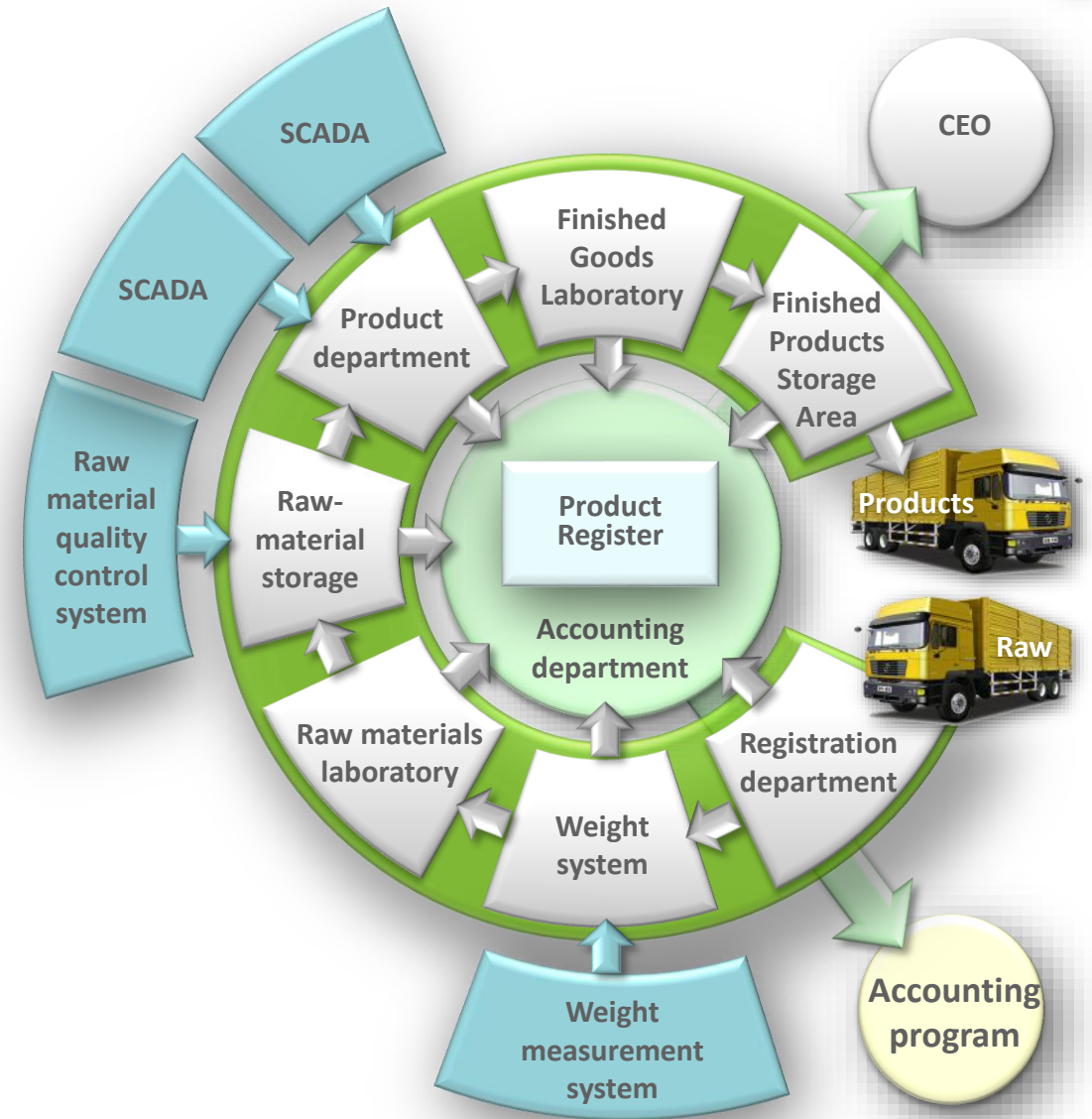


SAKURA-Production ERP PLM system of automated quantitative and qualitative accounting of products is designed for comprehensive automation of enterprise management, planning and control of production

**The main functions of SAKURA-P:**

- ✓ Obtaining and analyzing information about the work of the enterprise
- ✓ Formation and control of sound plans based on the analysis of data on available resources
- ✓ Operational control and management of material resources
- ✓ Prevention of loss cases, theft probabilities and fraud in processing and releasing of products
- ✓ Analysis of the enterprise results and formation of the optimal labor organization and production processes
- ✓ Increasing labor productivity through the redistribution of functions, rights and responsibilities of working staff and administration

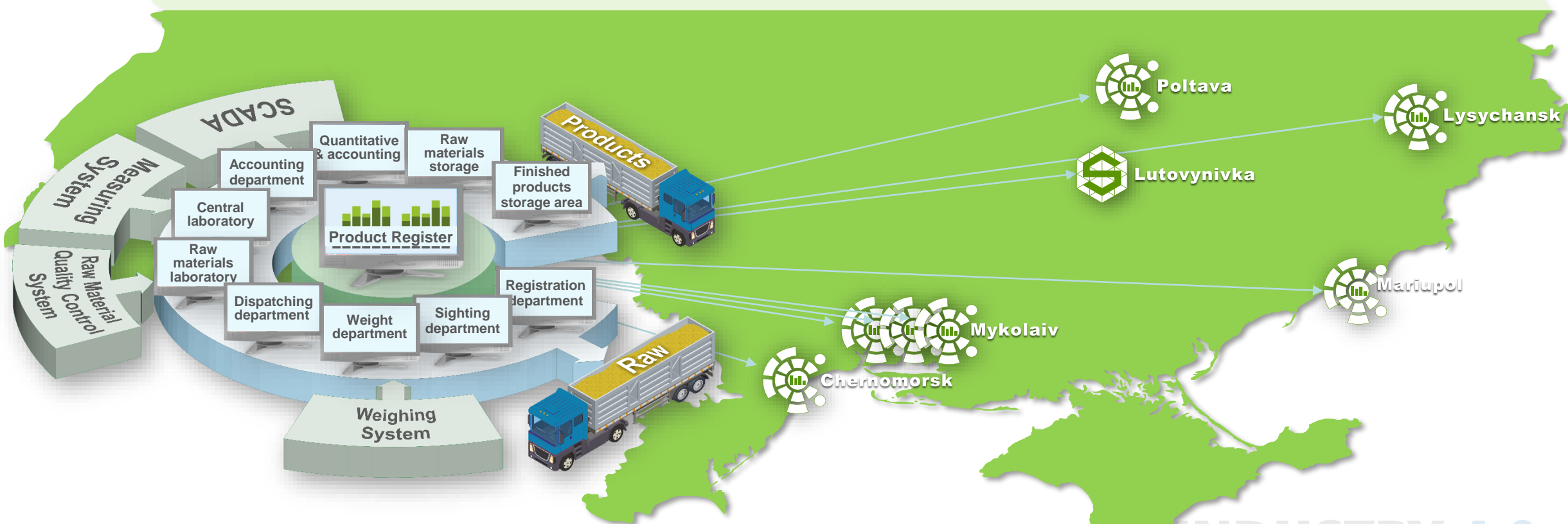
**SAKURA-P combines technological document management of the enterprise with production-warehouse and quantitative & accounting of production**



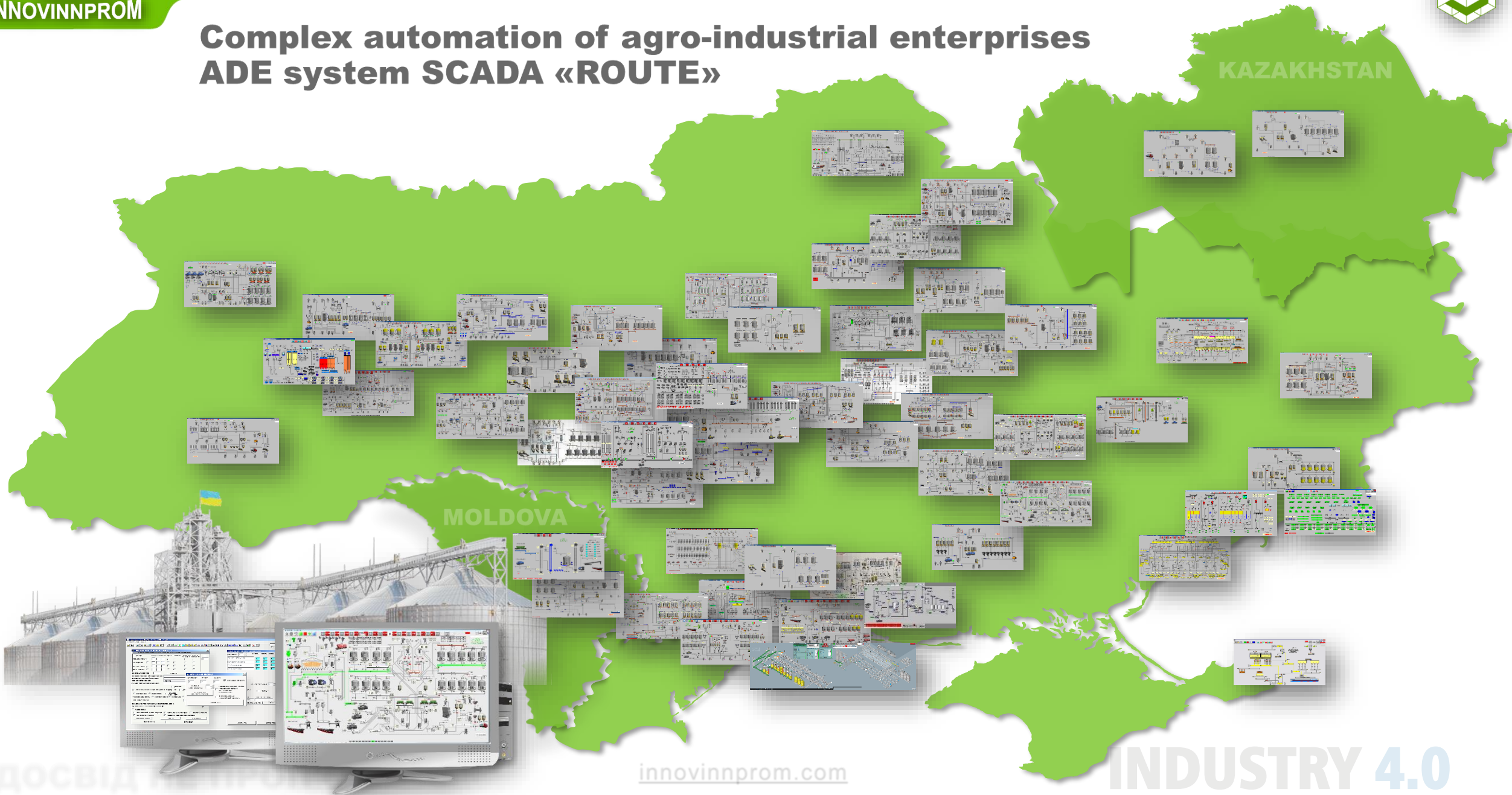


## Implementation results of the information and analytical ERP PLM systems «SAKURA-B»

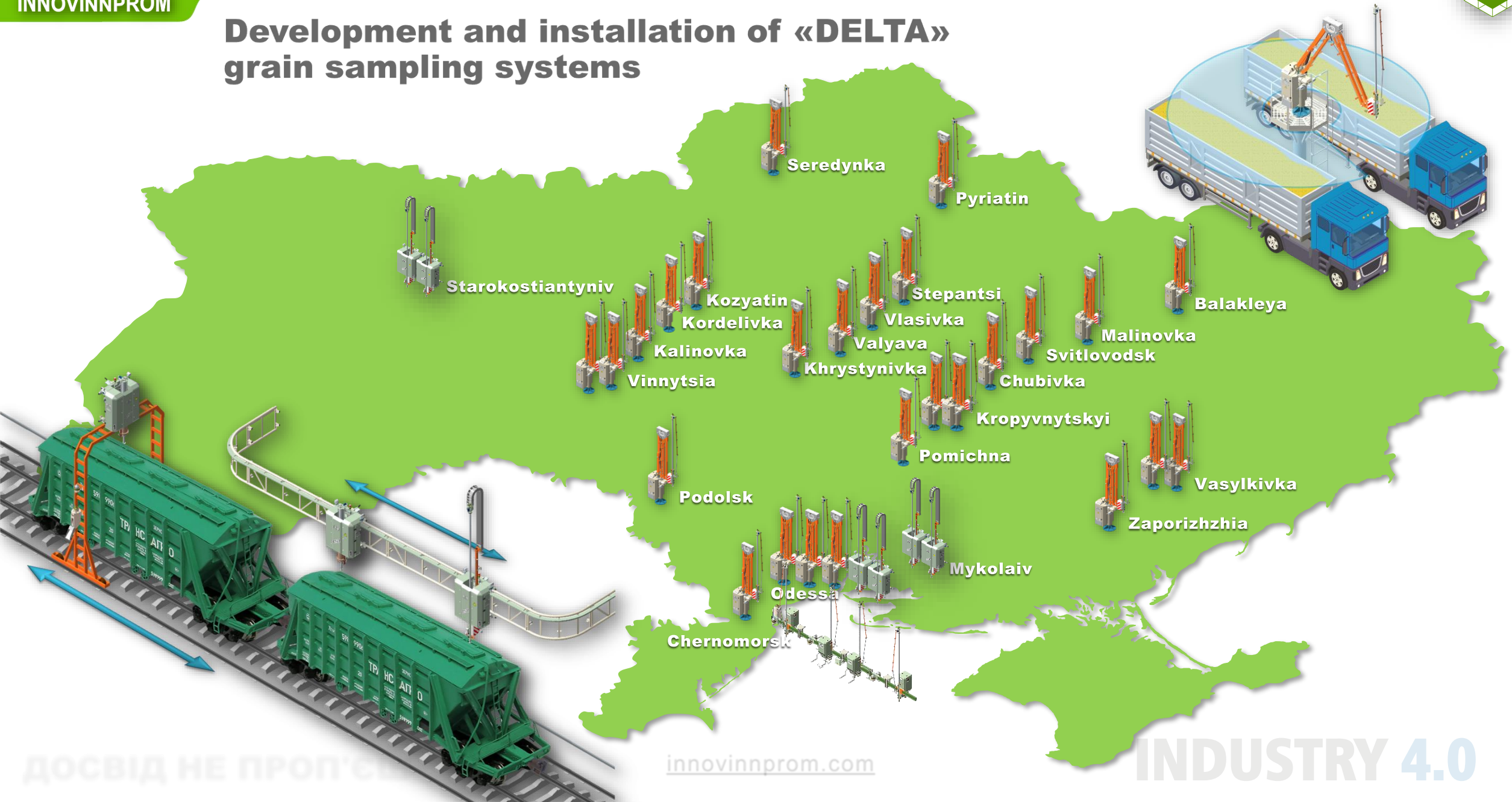
«SAKURA-Production» is a system of automated quantitative and qualitative accounting of grain and bakery products, which is designed for comprehensive automation of management of grain receiving and grain processing enterprises, product life cycle management, as well as enterprise resource planning.



## Complex automation of agro-industrial enterprises ADE system SCADA «ROUTE»



## Development and installation of «DELTA» grain sampling systems





SAKURA-IIOT

Alternative systems



Licensing not required



Open programming platform



Open source code



Popular programming languages



Works with any cloud service



No need for installation



The need for high-cost licenses



Proprietary programming platform



Closed source code



Specific programming languages



Payment for the imposed cloud service



The need to setup installation packages



## Reduction of energy consumption of technological equipment - up to 10%

Achieved by selecting and controlling the most energy-efficient modes of operation of the equipment and optimization of technological delays



## Reduction of technological losses - up to 15%

Achieved by preventing violations of established algorithms and standards at all stages of production, continuous monitoring of technological operations and personnel actions



## Improving energy efficiency of production - up to 20%

Achieved through continuous monitoring and analysis of energy efficiency of production, control of accuracy and timeliness of completing technological tasks



## Increase of the equipment service life - up to 25%

Achieved by planning and monitoring the maintenance and repair of equipment, quality control of spare parts from different manufacturers





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Industry 4.0