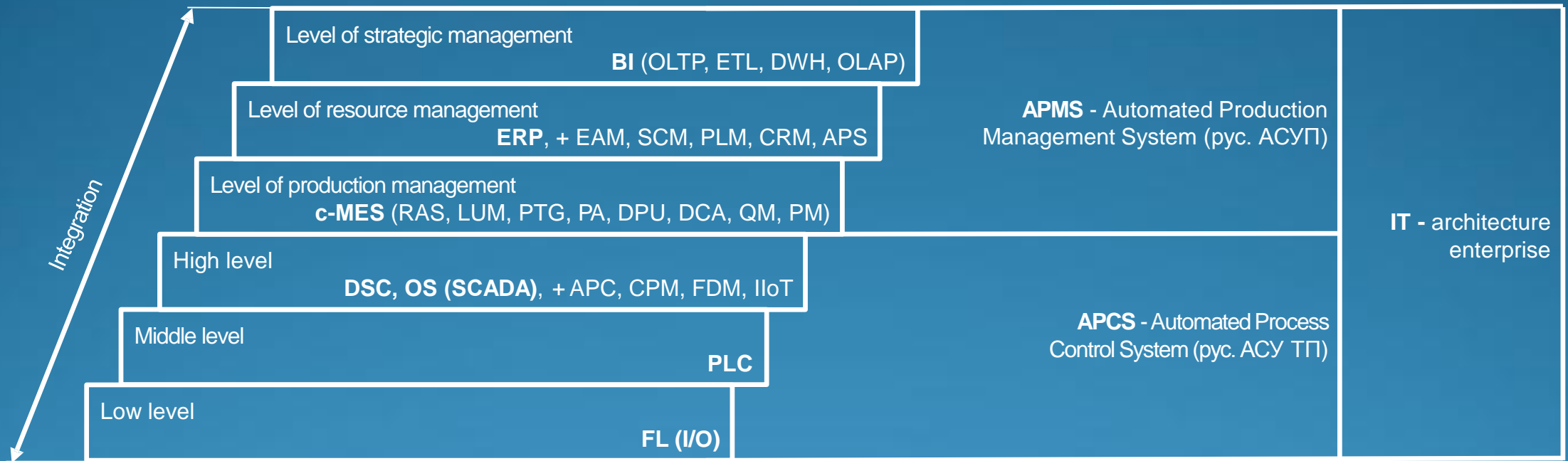


IT – HIERARCHY ENTERPRISE



BI - Business Intelligence

OLAP – On Line Analytical Processing

BW - Business Warehouse

BO - Business Object

ERP - Enterprise Resource Planning

CRM - Customer Relationship Management

PLM - Product Lifecycle Management

EAM - Enterprise Asset Management

APS - Advanced Planning & Scheduling

c-MES - Collaborative Manufacturing Execution System

RAS - Resource Allocation and Status

LUM - Labor/User Management

PTG - Product Tracking & Genealogy

PA - Performance Analysis

DPU - Dispatching Production Units

DCA - Data Collection/Acquisition

QM - Quality Management

PM - Process Management

DCS - Distributed Control System

SCADA - Supervisory Control and Data Acquisition

OS - Operating System

APC - Advance Process Control

CPM - Control Performance Monitor

IIoT - Industrial Internet of Things

PLC - Programmable Logic Controller

FL - Field level

I/O – Input / Output

c-MES - Level of production management

1. **RAS** (Resource Allocation and Status)

2. **LUM** (Labor/User Management)

3. **PTG** (Product Tracking & Genealogy)

4. **PA** (Performance Analysis)

5. **DPU** (Dispatching Production Units)

6. **DCA** (Data Collection/Acquisition)

7. **QM** (Quality Management)

8. **PM** (Process Management)

Subsystems: **ODS** (Operations / Detail Scheduling), **DOC** (Document Control), **MM** (Maintenance Management) – was eliminated in 2004 from the basic model MESA-11 (international association MESA, 11-subsystems) – but now there are proposals and implementations both separately and in the complex of these subsystems (what leads to duplication with the system ERP).

c-MES – development model Collaborative Manufacturing Execution System (8-subsystems) since 2004.

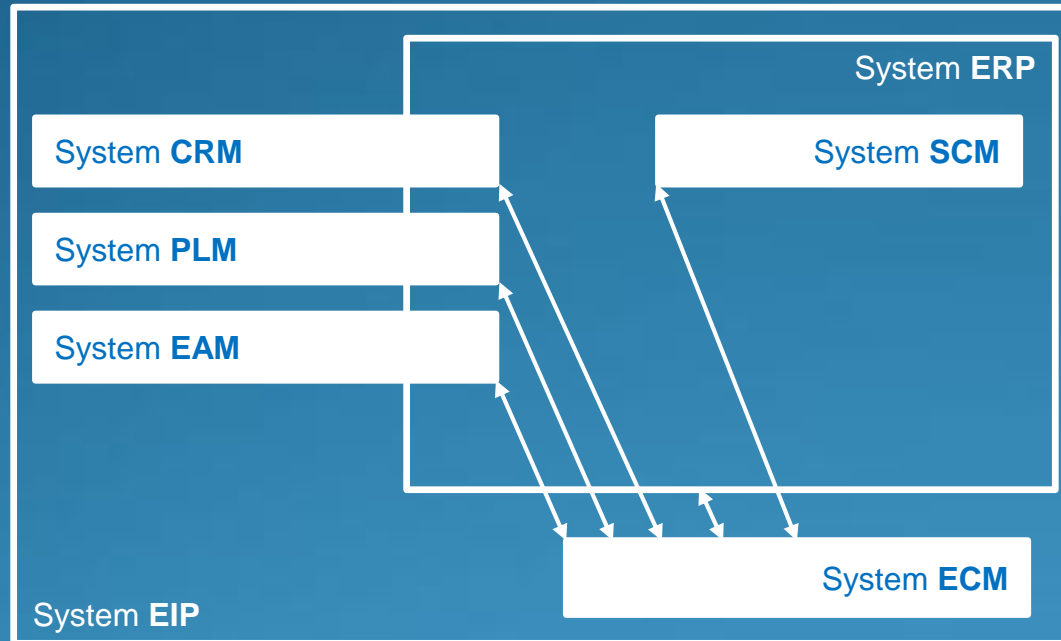
According to statistics, c-MES provides:

- reduced production cycle time by an average of 45%;
- reduction in data entry time 75%;
- reducing the number of work in progress by 24%;
- decrease in paper reporting between shifts by an average of 61%;
- reduction of the production cycle time by an average of 27%;
- reduction in the volume of marriage by an average of 18%;
- reduction of unnecessary paper documentation by 56%.

Leaders in MES solutions in 2018 (Gartner. Magic Quadrant for Manufacturing Execution Systems):

- Honeywell Connected Plant (HCP)
- Siemens PLM Software
- SAP
- Dassault Systems
- Rockwell Automation

ERP (Enterprise Resource Planning) + systems: EAM, SCM, PLM, CRM, APS



Decision leaders ERP:

- SAP: SAP Business All-in-One и SAP Business One (SAP HANA).
- Microsoft: Microsoft Dynamics AX.
- 1C.
- Oracle.

ERP - organizational and information system that integrates production and operations, human resources management, financial management and asset management, focused on the optimal use of enterprise resources.

EAM (Enterprise Asset Management) - information system aimed at optimal management of physical assets and their modes (operation, risks and costs throughout the life cycle to achieve and implement the strategic plans of the organization.

SCM (Supply Chain Management) - information system designed for automation and management of all stages of supply of the enterprise and for control of all goods. It covers the entire product cycle: the purchase of raw materials, production, distribution of finished products.

PLM (Product Lifecycle Management) - a system, including application software, for product lifecycle management.

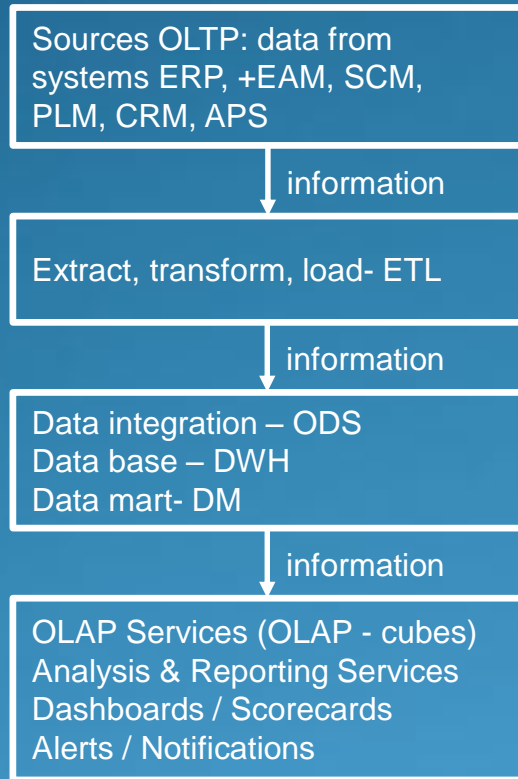
CRM (Customer Relationship Management) - application software for organizations intended for automation of strategies of interaction with customers (clients), in particular for increase of level of sales, optimization of marketing and improvement of customer service by saving information on clients and history of relationship with them, establishment and improvement of business processes and the subsequent analysis of results.

APS (Advanced Planning & Scheduling) - advanced planning, software for production planning, the main feature of which is the ability to build a schedule of equipment throughout the enterprise.

ECM (Enterprise Content Management) - enterprise information resources management system or corporate information management.

EIP (Enterprise Information Portal) - corporate portal, information automated system that provides employees with the necessary services in a single order.

BI – Business Intelligence - Level of strategic management



BI (Business Intelligence) - identification of computer methods and tools for organizations that provide translation of transactional business information into human-readable form suitable for business analysis, as well as media for working with such processed information. The purpose of BI is to interpret a large amount of data, focusing only on key performance factors, modeling the outcome of various options, tracking the results of decision-making. BI supports a variety of business solutions — from operational to strategic.

OLAP (On Line Analytical Processing) - interactive analytical processing, technology of complex multidimensional data analysis. The reason for using OLAP to process requests is speed. OLAP-cubes-technology that allows you to do in real time (1-5 seconds) any reports and conduct a full analysis of the data.

OLTP (Online Transaction Processing), transactional system-real-time transaction processing. A way to organize a database in which the system works with small transactions, but with a large flow, and the client requires minimal response time from the system.

ETL (Extract, Transform, Load) - tools: programs that allow you to load data into DWH from different accounting systems.

DWH (Data Warehouse) - storage: a complete SQL database for preparing and storing data for Analytics.

ODS (Operational Data Store) - a database designed to integrate data from heterogeneous sources and then use that data by applications.

DM (Data Mart) – a subset of a data warehouse organized to solve analytical problems.

The largest provider of BI solutions: GlowByte Consulting, Softline, Техносерв, Крок.
Popular BI platforms: QlikView, Klipfolio, Tableau, Power BI.