



## Data analysis and simulations in intralogistics

The Market Operations department of System Logistics S.p.A hosts the Pre-Sales & Execution Engineering Department, which deals with the definition, development and enhancement of intra-logistics solutions proposed by the Company during the sales phase (**Pre-Sales Engineering**), and that are subsequently finalized during the executive phase (**Execution Engineering**).

The **Pre-Sales Engineering** department analyses, models, develops the layout of, budgets and processes the attachments for the technical offer concerning new project solutions, modifications of projects in progress and major expansions of existing plants.

Within the Pre-sales Engineering department, **System Engineering** is responsible for data analysis, sizing of logistics flows and study of the macro-functionality that the proposed solution shall manage. It also develops simulations for prototype plant studies, specific inspections on subsystems and dynamic validation of solutions.

Each project has unique features, so that the operations to perform are identified on demand, with the aim of finding the best solution for each customer.

### 1. DATA ANALYSIS

**The analysis activity** studies the customer's plant logistics in detail and sets the basis for solution sizing. The data provided by the customer and containing all the main information on intra-logistic processes are then examined; activities such as *order management and preparation* are subsequently mapped in detail (e.g. evaluating the picking activity profiles), and finally a *storage profile* is outlined together with all the *activity flows* to include in the study (such as material receipt flows, production flows, shipment flows or any operation to take into account and to manage within the scope of the proposed solution).

The "*flows*" generally represent the number of units handled within a certain time interval. In terms of intra-logistics, this translates into *number of pallets, packages* or generally speaking, *units handled* on a daily or hourly basis.

### 2. SIZING

During the analysis phase, after completing mapping of the logistic flows according to the data received from the customer, the study is carried out and the bases for plant *sizing* are laid down.

During the sizing phase, growth projections are applied to the profiles as well as to the flows resulting from the analysis. Contextually, the reference scenario for the solution is outlined: the macro areas, i.e. the main elements that will make up the system and the relative flows to handle will be thus identified and represented by means of appropriate *block diagrams*.

These diagrams are graphical representations of solutions and consist of blocks and arrows connected to each other: the geometrical shapes (blocks) represent the individual areas/elements of the solution, while the connecting arrows represent the flows/movements of materials (with the relative values) that the different areas exchange. **ADD IMAGE**

#### System Logistics S.p.A

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### 3. SIMULATION OF SYSTEM OPERATION

The *simulations* are carried out for *prototype system studies*, specific *subsystem checks* and *engineering studies*.

Using a *simulation* software, System Engineers are able to recreate - virtually but accurately - industrial systems of any level of complexity and detail, with both manual and automatic operations.

The simulations take into account machine operations and all the material flows / handling mapped in the model.

The management logics of the system and all of its elements are carefully customised by means of a *development code*, so as to recreate the system management logic as faithfully as possible, as in a real installation.

The simulations represent a very effective tool and add value to the sales offer as they provide the customer with both an *overview* of the entire system and its functionalities, as well as a *360° evaluation* of the technological solution in dynamic mode.

### 4. FEASIBILITY STUDIES

*Feasibility studies* are conducted with the aim of proposing a solution that optimally meets the customer's needs, both in terms of technical/functional requirements as well as from an economic point of view. These studies are the result of close collaboration and teamwork of Pre-Sales Engineering, Sales Area Managers, and all company functions transversally involved in specific requests.

### 5. BEVERAGE & RETAIL

As regards projects in the Beverage & Retail sector, or in general where automatic picking solutions are required, it is often necessary to conduct *specific studies* involving more *in-depth evaluations* vs. standard analyses. The analysis methods are therefore based on the use of the same tools, but provide a higher level of detail regarding all the individual parts that make up the solution.

In addition to the standard study of the "pallet" element, it is often necessary to size components or ad-hoc areas for specific functions, where even the unit (package) flows involve dramatically higher quantities than traditional pallet handling solutions.

The projects in the Retail sector represent a further extension, in terms of complexity, with respect to the Beverage industry projects, considering the wide range of codes handled (from 5,000 to over 30,000 SKUs), product families and variety of formats.



A MEMBER OF THE KRONES GROUP

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