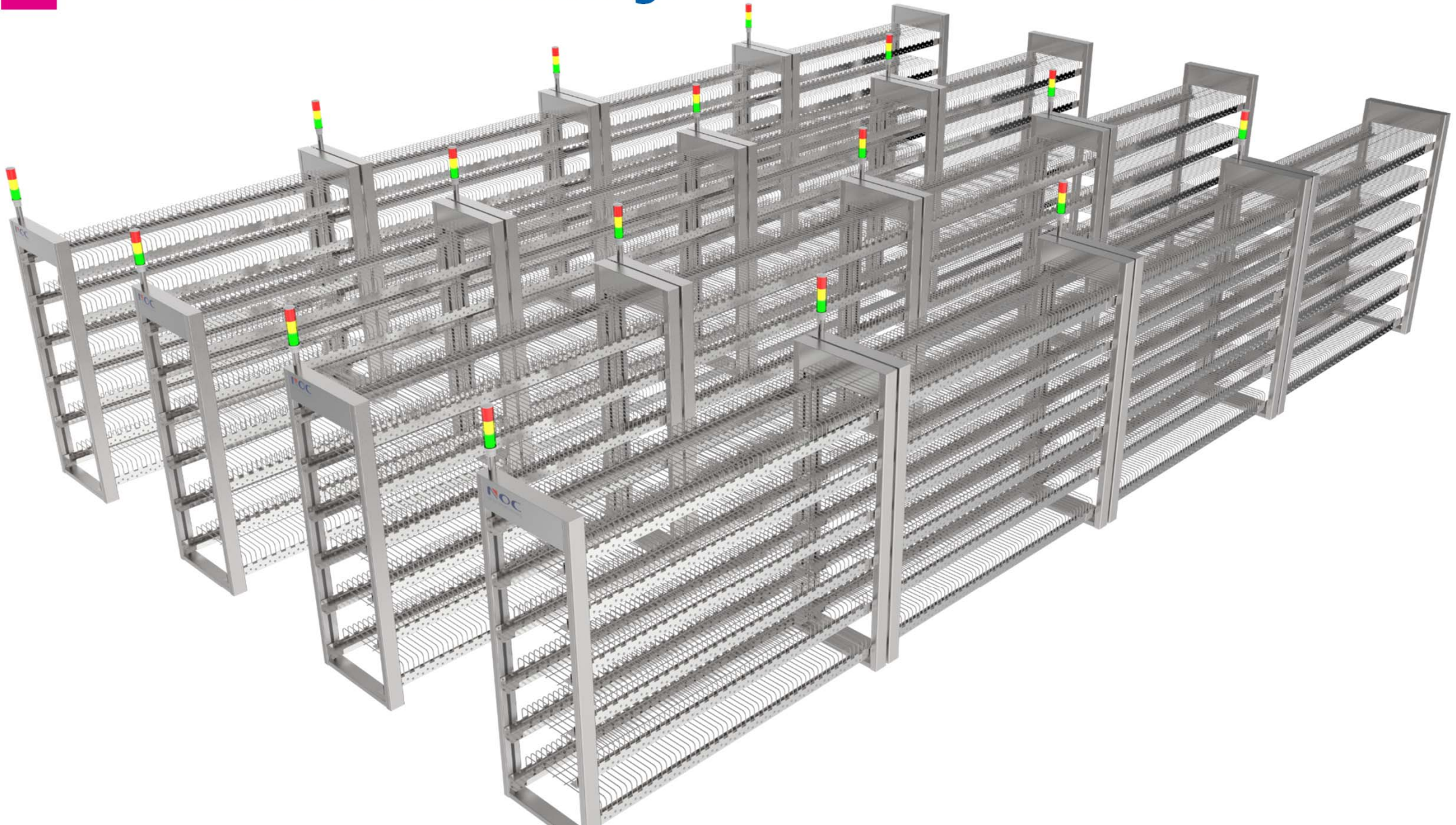




**MOREL EQUIPMENTS CO., LTD.**

**Intelligent Storage System  
Catalog**

# Warehouse renderings



# Warehouse renderings



100

Name: Intelligent electronic shelf

Material: stainless steel

## Points:

# Management is simple

- Reduce manpower and increase efficiency
- System control FIFO, eliminate human interference
- Visual management, light on ingredients, reduce staff operation requirements

efficiency

- Space utilization increased by 300%
- The feeding speed is increased by 50% and the taking speed is increased by 80%
- Mobile storage, nearby storage, improve storage utilization.
- Staff skills
- Personnel skills are not required
- Turnover has no effect
- Location to remind
- Alarm lights remind shelf location
- LED lights remind the storage location



## Product parameters

| model               | N344S              | N396S               | N236S              | N516S               | N840S                   | N240S                    | N480S                    | N1400S                  |
|---------------------|--------------------|---------------------|--------------------|---------------------|-------------------------|--------------------------|--------------------------|-------------------------|
| size                | LWH/920*400*1590mm | LWH/1350*400*1400mm | LWH/920*400*1560mm | LWH/1320*400*1740mm | LWH/2100*400*1800mm     | LWH/2100*650*1800mm      | LWH/2100*650*1800mm      | LWH/2100*400*1800mm     |
| Material type       | 7 inch + 13 inch   | 7 inch + 13 inch    | 7 inch + 13 inch   | 7 inch + 13 inch    | 7 inch (thickness>16mm) | 13 inch (thickness>28mm) | 13 inch (thickness<28mm) | 7 inch (thickness<16mm) |
| 7inch Store digits  | 320                | 360                 | 200                | 480                 | 840                     | 0                        | 0                        | 1400                    |
| 13inch Store digits | 24                 | 36                  | 36                 | 36                  | 0                       | 240                      | 480                      | 0                       |
| Rack type           | mobile             | mobile              | mobile             | mobile              | stationary              | stationary               | stationary               | stationary              |

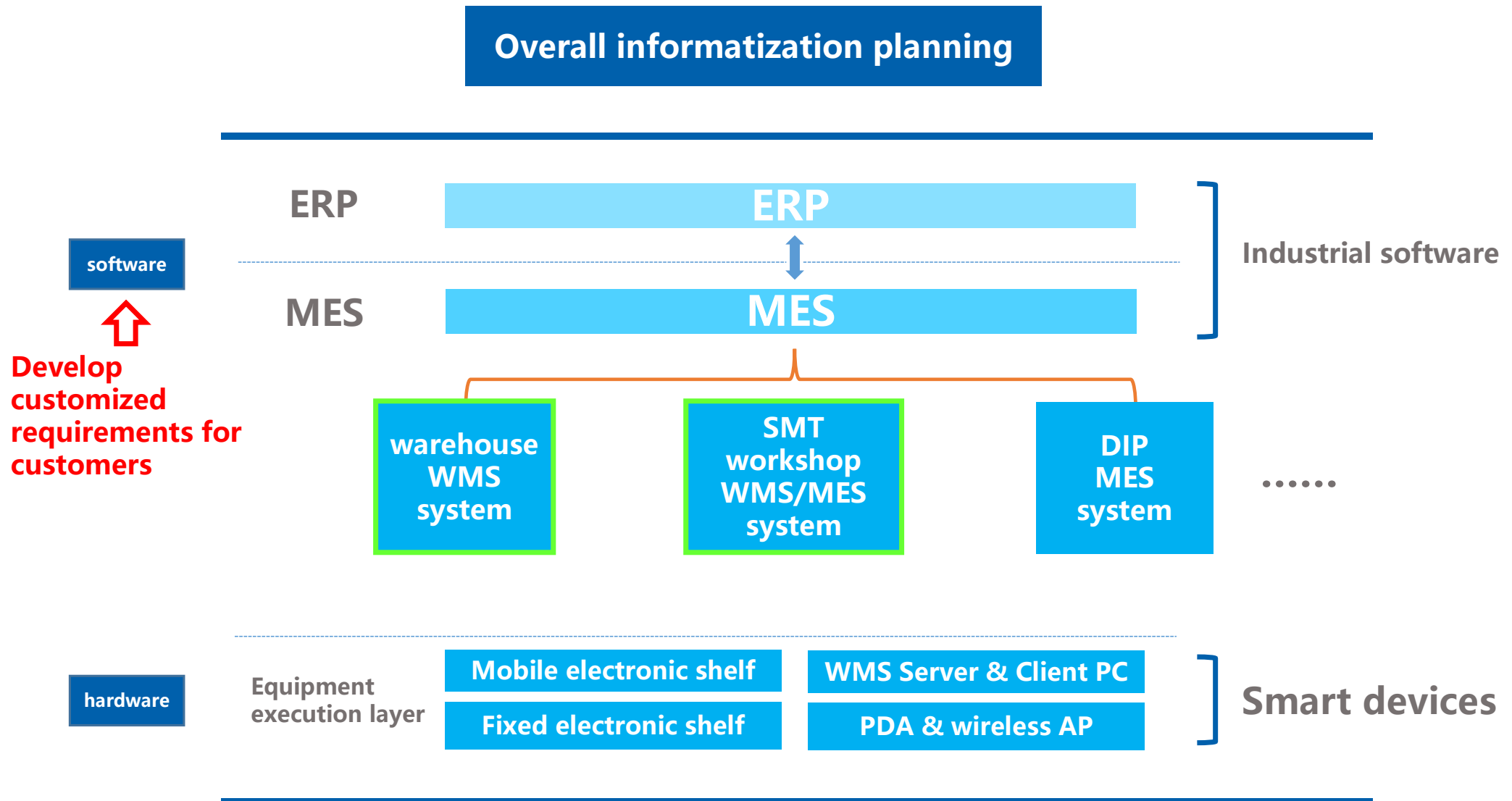
### PS:

1.7inch material, single storage of 1400 plates (plate thickness is less than 16mm, the thickness is greater than 16mm put 840 plates), double-sided storage, covers an area of 0.84 square meters;

The 2.13-inch material can be stored in 480 plates (the thickness of the plate is less than 28mm, and the thickness is greater than 28mm, and 240 plates can be stored on both sides, covering an area of 1.37 square meters

All the above models are for storing roll packing materials. For packaging materials such as Tray and Stick, we can customize according to the actual needs of customers

## System architecture



## warehouse/The line positions



The line positions

### Fixed electronic shelf:

Description:

Multi-color LED (according to the actual needs of customers), support multiple sets of work orders at the same time to prepare materials for delivery

Double access material

Shelving time: 5.2s/ disk (recommended storage mode: 2~ 3S/disk)

Pull down: Pull down scan or unified pull down scan for each disk, working time < 3S/disk

The PDA scanner supports WindowsCE and Windows Mobile platforms

No specific requirements for PC configuration

# The production line



**Mobile electronic shelves: Store materials for production line work order**

## Functional specifications:

1. Interact with SMT information

2. Monitor the allowance of materials and parts at each station in real

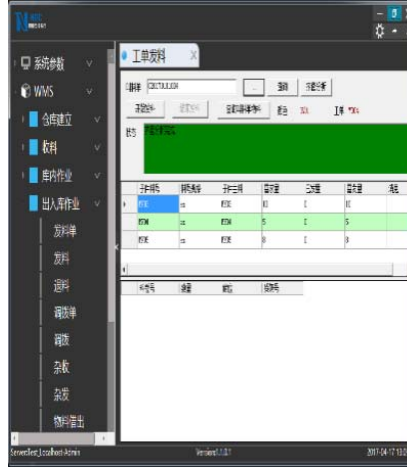


Replace the personnel to determine the timing of receiving material and find material, the system to determine the timing of receiving material, automatic material light display; The personnel take and receive the material according to the light instruction. Compared with the traditional skip car, the time of finding the material is shortened to 0



**The production line**

# Electronic material actual control



panorama

Put in  
storage

Prepares  
materials

Take the  
material

For  
sending

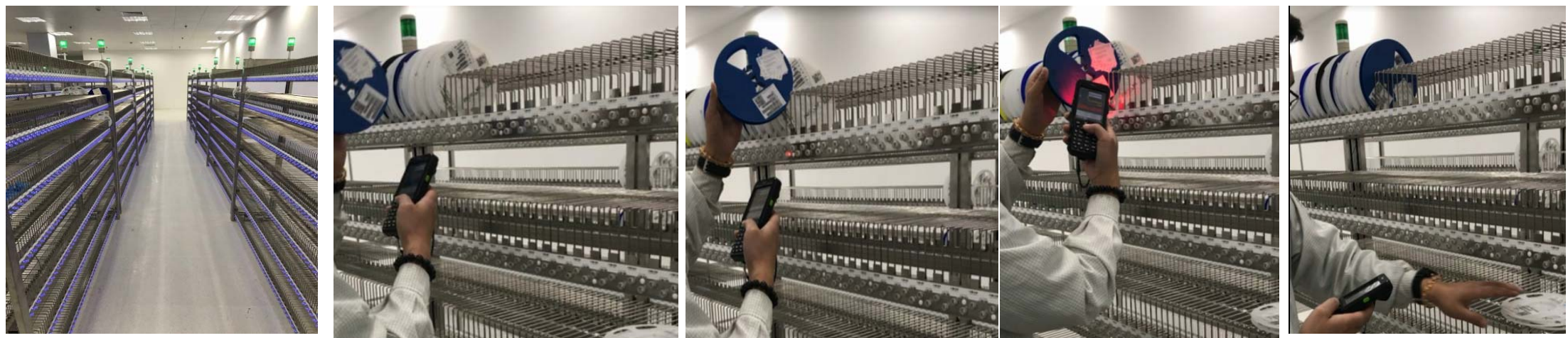
Description:

1. There are LED lights on the material shelf, and each LED light corresponds to a storage position
2. Bind the material roll to the storage position and place it on the corresponding storage position
3. Prepare materials according to work order, light up according to DATECODE FIFO principle
4. The warehouse keeper takes the material according to the light and puts it into the skip car
5. Execute material release and unbind with storage

**FIFO** principle

| ReelID  | PN   | LOT Number | Date Code | QTY  | Supplier | Ctimestamp      | Outbound order |
|---------|------|------------|-----------|------|----------|-----------------|----------------|
| A000001 | Axxx | Lxxx1      | 1701      | 1000 | MURATA   | 2017/3/17 15:41 | 1              |
| A000002 | Axxx | Lxxx2      | 1702      | 1000 | MURATA   | 2017/3/17 15:42 | 2              |
| A000003 | Axxx | Lxxx3      | 1703      | 1000 | MURATA   | 2017/3/17 15:43 | 3              |

## Electronic material receiving and warehousing - operation



panorama

Use PDA to  
scan the  
empty storage

Lights  
correspond to  
the storage  
location

Scan the  
material roll  
in the storage  
position

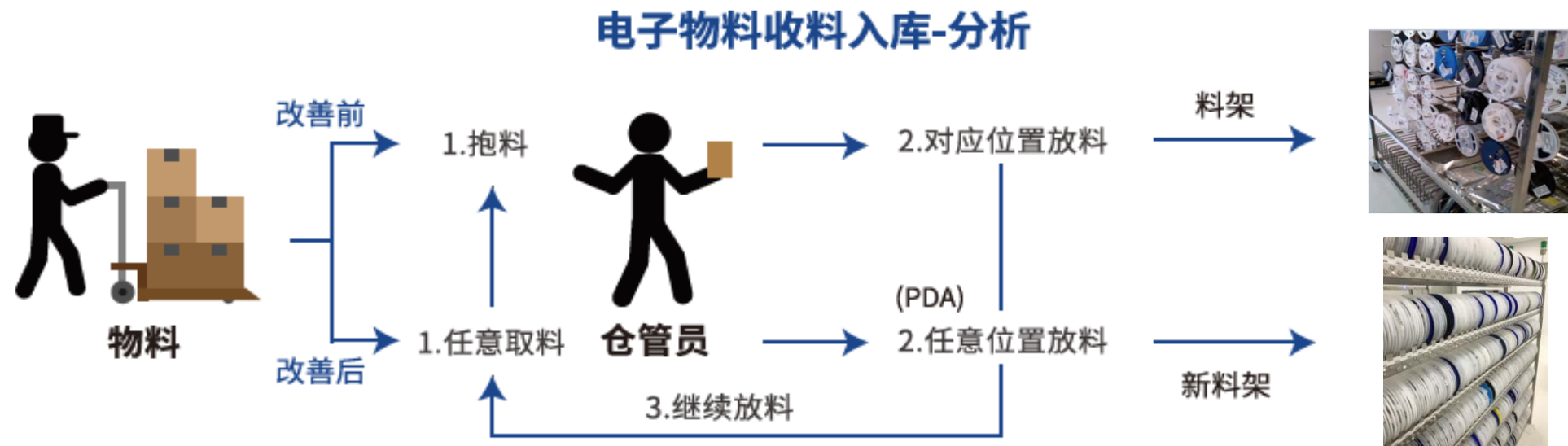
Right out  
the light

Description:

1. Feeding personnel, push the material cart to the material rack
2. Empty storage. Use PDA to scan the empty storage and LED to light it
3. Put the material tray on the storehouse where the light is on, scan the QR code of materials and parts with PDA, turn off the light and complete the feeding
4. Repeat the above steps and continue feeding. Feeding does not affect the feeding.

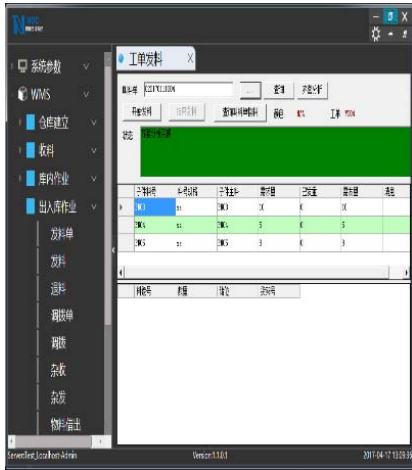
PDA anti - stay instructions:  
1. Scanning position light flashes  
2. The material has been bound  
3. Bind the prompt location again  
Occupied or coiled  
Location, can not be on the shelf

# Electronic material receiving and warehousing - analysis



| Warehouse personnel |                               |      |       |        |                                                                                                                                                                              |
|---------------------|-------------------------------|------|-------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | project                       | now  | after | effect | remarks                                                                                                                                                                      |
| 1                   | Personnel training            | 90D  | 2D    | 98%    | After improvement: Staff training days decreased by 97%                                                                                                                      |
| 2                   | Personnel skill requirements  | High | no    | 100%   | After improvement: no personnel skill requirement, reduced by 100%                                                                                                           |
| 3                   | Impact of personnel change    | yes  | no    | 100%   | After improvement: the flow of personnel has no effect on the work of the warehouse                                                                                          |
| 4                   | Time consuming for 100 plates | 50   | 16    | 300%   | Before improvement, 100 plates of material were placed 50min<br>After the improvement, 100 plates of material were placed in 16min, and the efficiency was increased by 300% |
| 5                   | Number of people              | 8    | 3     | 63%    | After the improvement, the staff was reduced by 63% and the efficiency increased by 300%                                                                                     |

# Electronic material preparation - operations



material  
work order

Material  
rack lights  
up

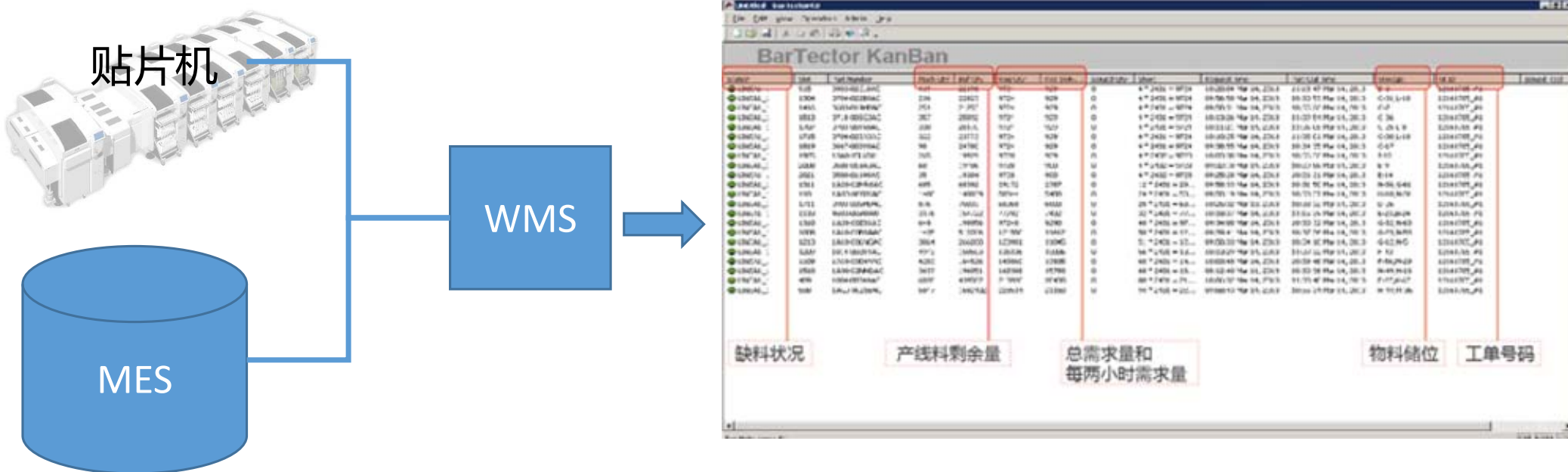
Take the  
material

Release  
material  
loading truck

Description:

1. Material preparation personnel according to the lack of material work order, **each color represents 1 set of work order, the use of N colors can be matched with N sets of work order material, the batching efficiency is N times of monochrome LED**
2. The material on the material shelf is illuminated by FIFO rules
3. Take the material from the cart (take the material according to the light position)
4. The material will be released on the work sheet, and the corresponding storage light on the material shelf will be off

# Material low warning, the system automatically find material light



## Description:

Interact with the information of the placing machine, monitor the material allowance status at each station of the placing machine in real time, replace the personnel to judge the timing of receiving material and looking for material, the system determines the timing of receiving material, automatically look for material in the shelf and light up the light, according to the personnel to indicate the material receiving, compared with the traditional skip car, the time to find material is reduced to 0

## Low alarm automatic feed finding



**short of  
material**

**Material rack  
to find  
material light**

**Personnel take  
material brush  
off shelf**

**The shelves  
out the lamp**

Description:

1. The material rack regularly detects the material allowance at each station of the placing machine to reach the warning value. The system automatically finds material and lights up according to FIFO
2. Personnel take and receive materials according to the instructions of the light
3. Complete the material receiving, brush into the anti-error system, the system checks correctly, the material and parts will be automatically removed from the shelf and turn off the light, the system will continue to monitor whether there is material shortage; If the anti-error system is checked wrong, the material cannot be removed from the shelf, and the storage light and lighthouse are always on

## Non-electronic material shelf transformation

- Steel frame reconstruction, storage increased LED indicator light
- Each storage position can be stored in unit support disk/box/pallet, etc

### Shelves transformation



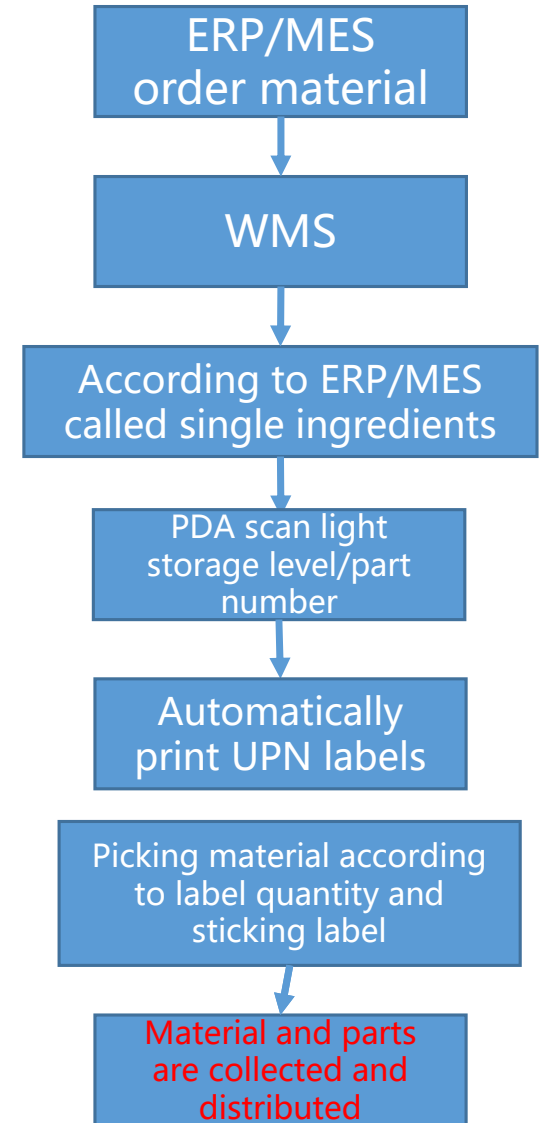
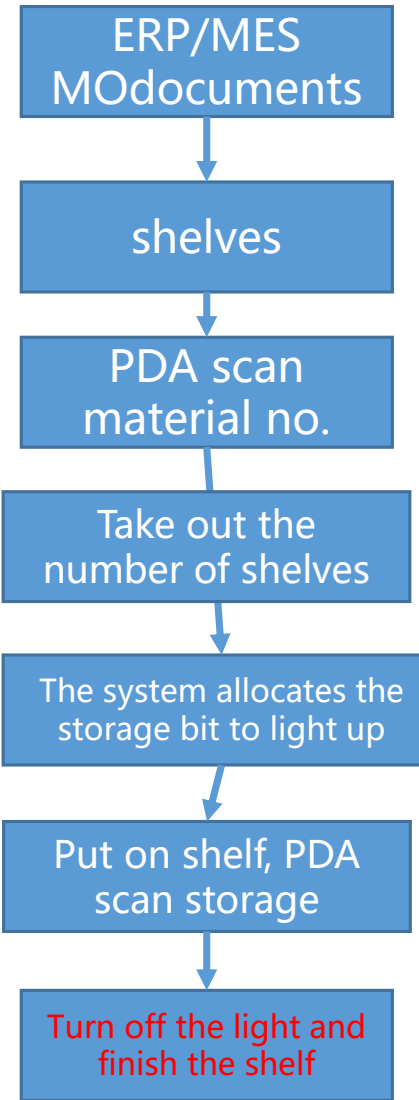
shelves  
For  
electrostatic  
box



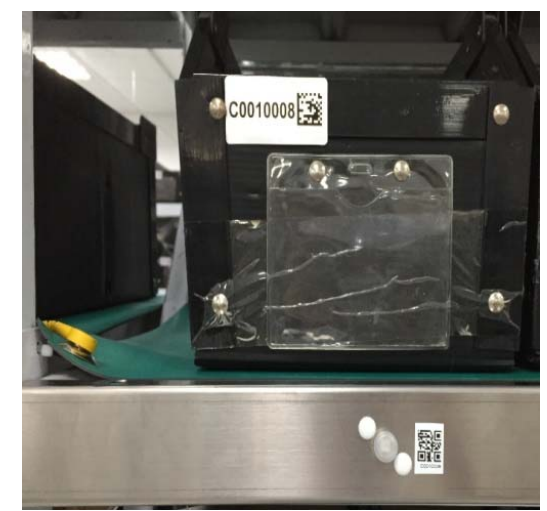
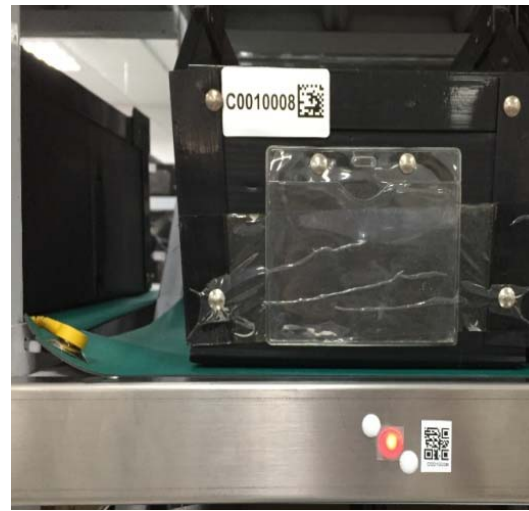
shelves  
For pallet



## Non-electronic material work flow



## Non-electronic material receiving material on the shelf



**Panoramic  
view of  
feeding**

**PDA scavenging  
system allocates  
storage location**

**Put into the  
corresponding  
light storage  
position**

**Scan the storage  
position and turn  
off the light**

Description:

1. Feeding personnel, push the trolley to the shelves
2. Use PDA to scan material UPN/PN, and the system automatically allocates storage location and lights up
3. Put the material into the light position, PDA scan the code of the light position, the light will be off if it is correct, and the error will be warned
4. Repeat the above steps and continue to put the material on the shelf. Feeding does not affect the material delivery.



## Software and peripheral system docking requirements

- According to the shelf (intelligent line warehouse light indicator) to the material according to the manufacturing batch in the way of minimum packaging to achieve FIFO receiving, delivery, storage management. According to the goods location (ordinary shelves without light indication) of the material according to the warehousing batch to achieve FIFO receipt, delivery, storage management. Common shelves can store a variety of materials in the same place
- Realize the quality assurance period management, the storage of overdue materials early warning management, according to the specified barcode such as by supplier, overdue, warehousing batch lock or freeze materials
- Realize the definition and analysis of 2D barcode rules, and realize the generation and printing of material unique code
- WMS has the function of quality inspection, which can store the quality inspection data and conclusion. Only qualified materials can be put into storage
- Basic data management: management of organizational structure, user and role authority, warehouse, warehouse, shelves, materials, suppliers and other basic data
- Business data management: it can store the information of the business documents in and out of the warehouse, for inquiry and guidance of business operations, such as work order, work order feeding order, purchasing warehouse entry order, material requisition order, transfer order, entrusted processing warehouse requisition order, outsourced processing warehouse entry order, outsourced processing warehouse requisition order, etc
- Implementing business data integration with other systems in the way of middle table, including extracting other system data from the middle table, writing the business data processed by WMS into the middle table for other systems to realize business integration. Or adopt other ways to realize the real-time integration interface with other systems. The integrated contents include warehouse, materials, suppliers and all kinds of inbound and outbound business documents
- Goods location, bar code: warehouse, shelf, warehouse, material bar code rules, bar code generation and printing and other Settings and management. Can manually import the receiving barcode list (the correlation list of outer packaging and minimum packaging) and store it in WMS, realizing the warehousing way of scanning large packaging to quickly read the barcode information
- Materials and suppliers: read from ERP, including but not limited to material basic information and supplier basic information, and realize timing or real-time synchronization with ERP basic information. WMS provides manual import of ERP materials and supplier information in Excel format and store in WMS, which can be edited and modified

**MOREL EQUIPMENTS CO., Ltd.**



**Thanks**