



# RFID-based Solution for SMEN

The global decentralized  
commercial VIoT ecochain

December 2017

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## SMEN

Xiamen Shimeng Clothing Co., Ltd. (SMEN) was established in 2006. It is a comprehensive clothing company integrating R&D design, manufacturing, brand promotion, providing marketing services as an integrated development system and a vertical brand retail system. The company has a number of brands of which SMEN is the most famous across the country with more than 1200 stores. SMEN has won "The Best Investment Value Brand", "East China Women's clothing brand TOP15" awards and got "2016 Xiamen Outstanding Employer" enterprise award.



## Problem areas in clothing industry management process

Due to the specifics and complexity of clothing industry, there are many problems in such areas of conventional logistics as warehousing, sorting, store sales, and inventory.



- **Complex product specifications, wide assortment and various designs, quick changes**
- **Slow production, inventory, and circulation during conventional warehouse management**
- **Great stock-in/stock-out volume difference**
- **Full-container and single-item stock-in/out models exist**
- **Frequent unpacking, messy piling up**
- **Finding the goods needed mainly depends on the workers' experience**
- **High inventory complexity and workload**
- **Inability to track clothing origin if wrongly distributed**

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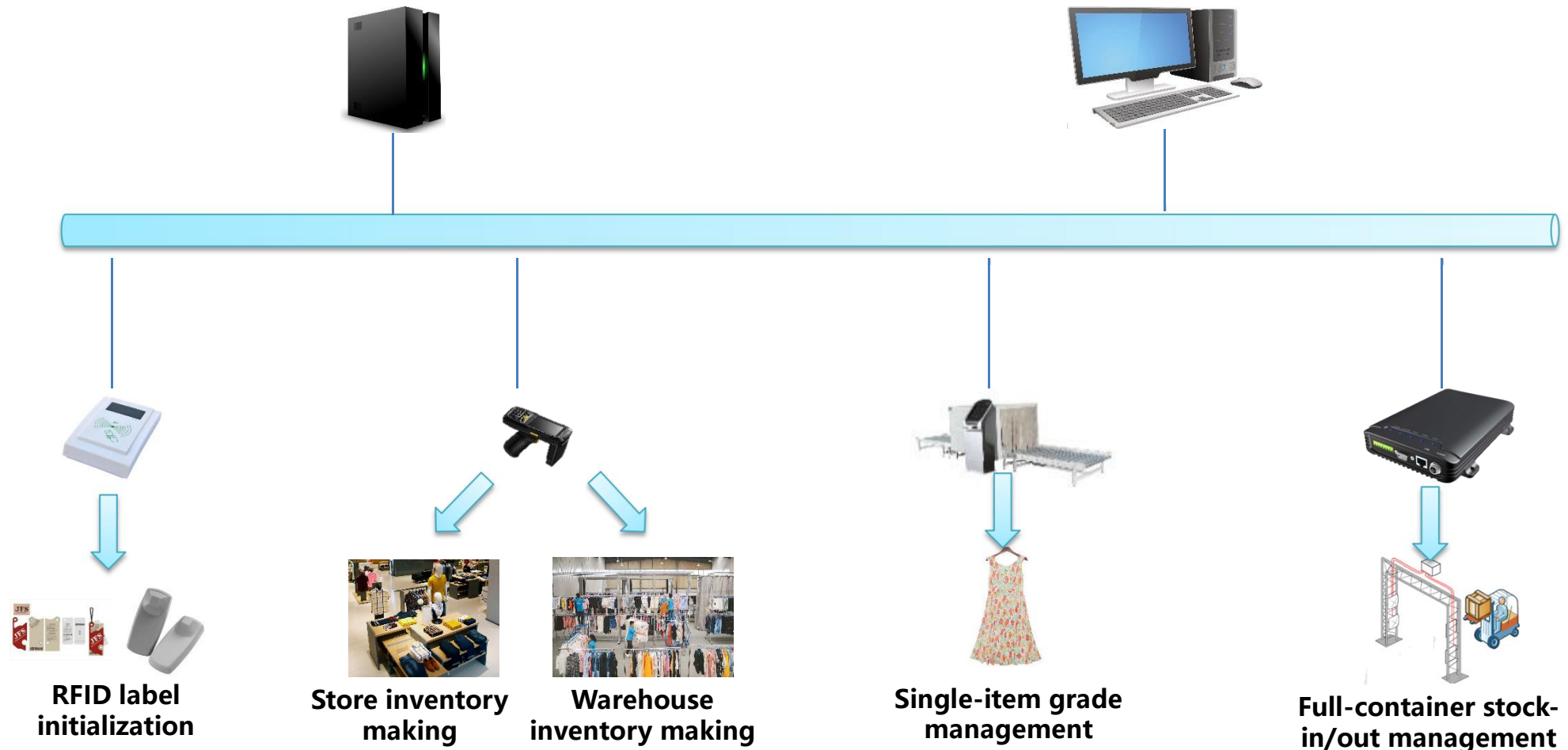
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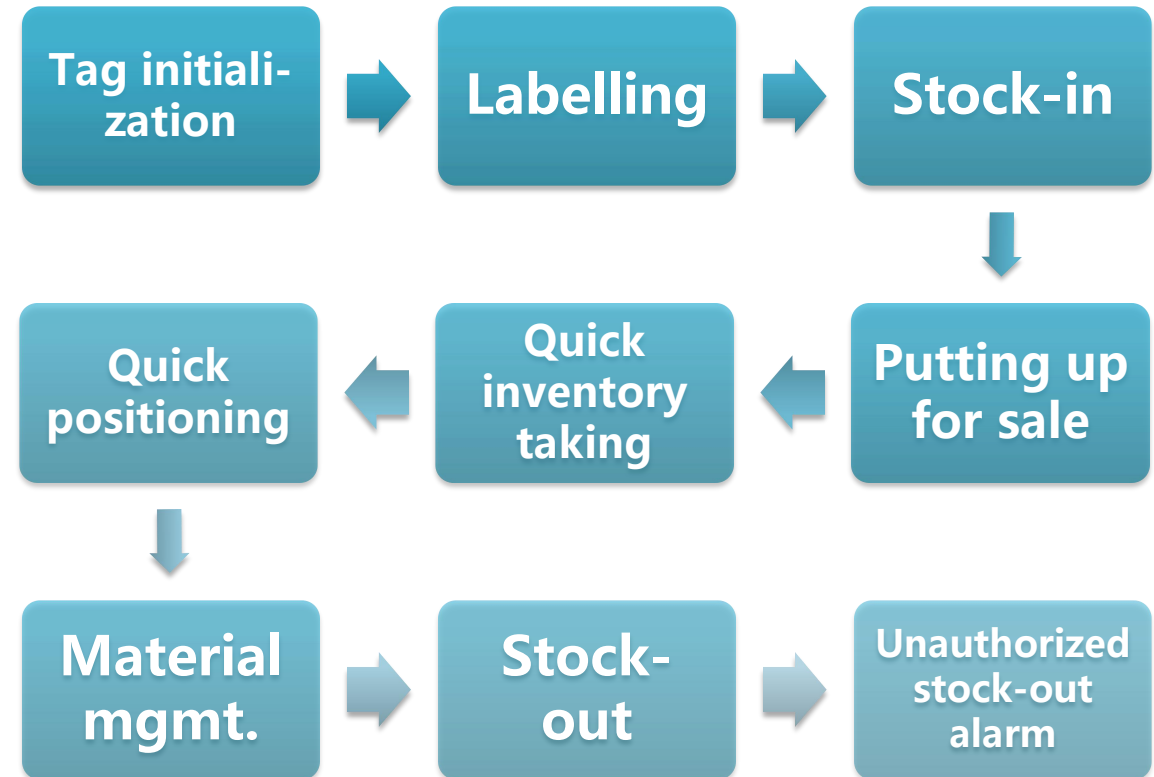
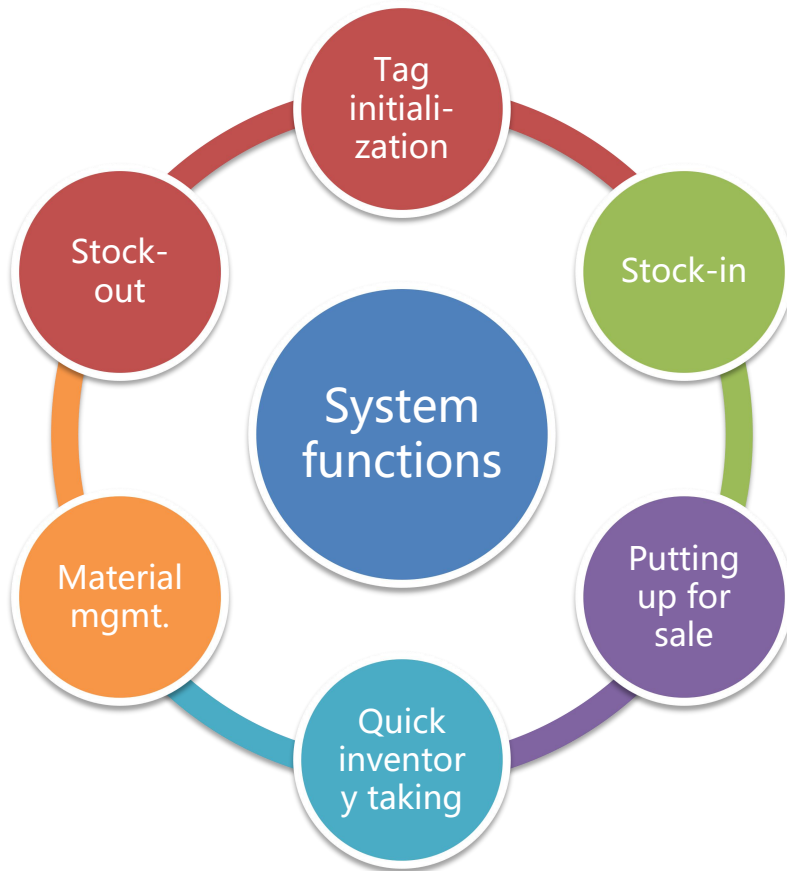
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# RFID-based smart warehouse solution system structure





Clothing tag is clothing information carried which includes material, specifications, precautions during washing and other information. There are label tags, fabric tags, imprinted tags etc. The ones used by stores are anti-theft tags, e.g. magnetic tags.

### Label tag



#### A. Thin type

Encloses an RFID tag, for packed end products, batch customization available

#### B. Thick type

RFID Inlay enclosed in hard label fiber, custom appearance possible

### Stick-on tag



Tags with sticky RFID Inlay directly applied to the back of a present label

### Woven/ imprinted tag



RFID Inlay woven/imprinted into the fabric

### Hard tag



EAS-compatible tag  
2 core functions: RFID + EAS anti-theft



## Electronic tag initialization:

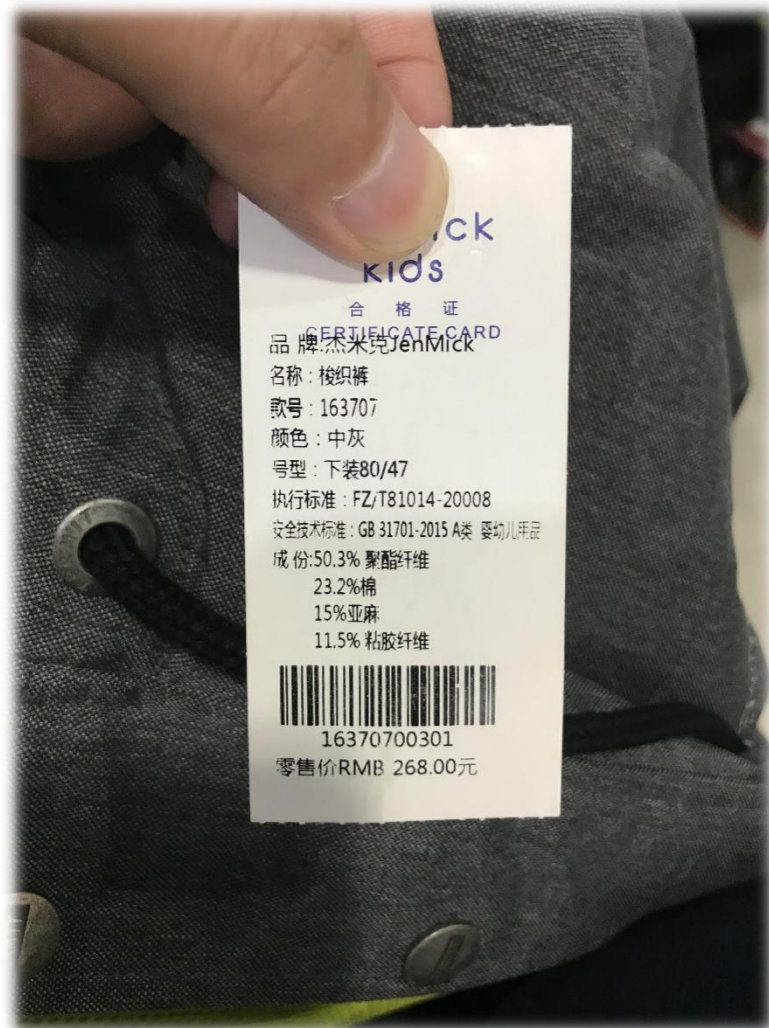
Empty tag > RFID tag printer > clothing

information printing > writing of information

into a tag chip > binding

## Labelling:

Tag initialization > applying to a clothing label



### **Goods management:**

Goods must not be unpacked, batch scanning tag data during clothing passage, comparison with stock-in order, checking the goods qty & model no., manual intervention error correction

### **Putting up for sale:**

Tag initialization > applying to a clothing label

### **Inventory taking:**

Handheld scanner scans location tags and rescans the goods awaiting inventory taking, the collected information is transferred to the backend server for data comparison, information on the difference is displayed on the handheld scanner in real time, after a manual check, inventory information on the backend server is updated by the handheld scanner

### **Stock-out:**

A small quantity goods stock-out check is performed using a handheld reader-writer. If errors are present, the reader-writer provides an automatic alarm and errors are corrected in time. Large quantity goods are transported to the exit by a forklift, a stationary reader-writer automatically identifies the stock-out goods. Inspection is finished quickly and accurately. If errors are present, after a timely alarm and manual intervention, the backend database data are updated, inventory consistency with system information is ensured.

### **Unauthorized stock-out alarm:**

Warehouse entry-exit stationary reader-writer scans goods tags, the collected information is send back to the backend server. The system automatically checks whether the goods match with the stock-out order. If not, the stock-out is deemed unauthorized and the alarm is set out automatically.

**消库取标**

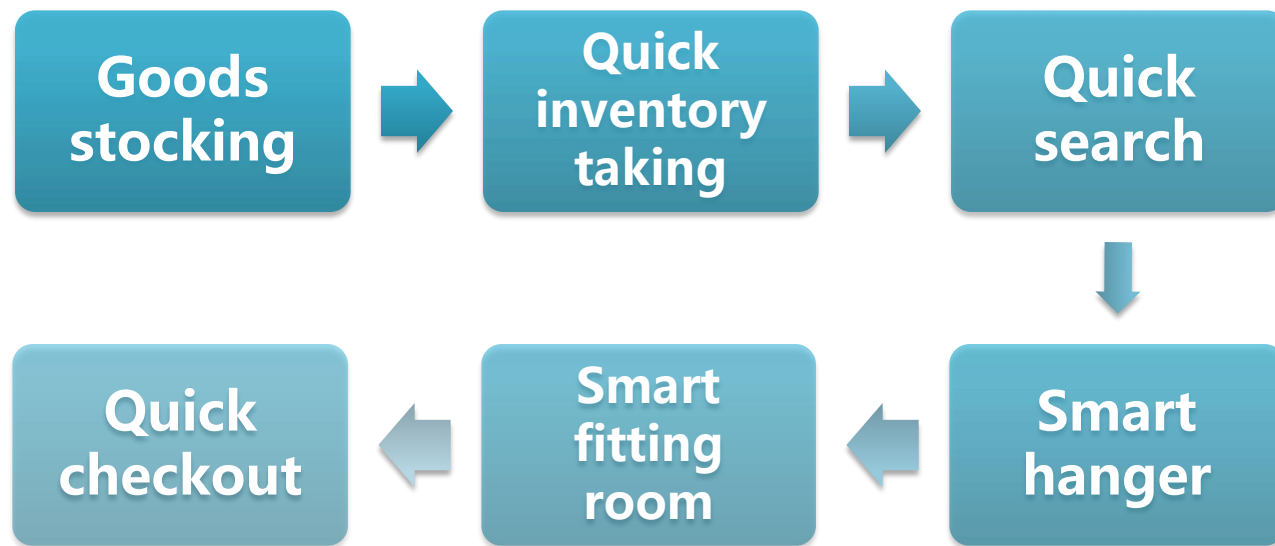
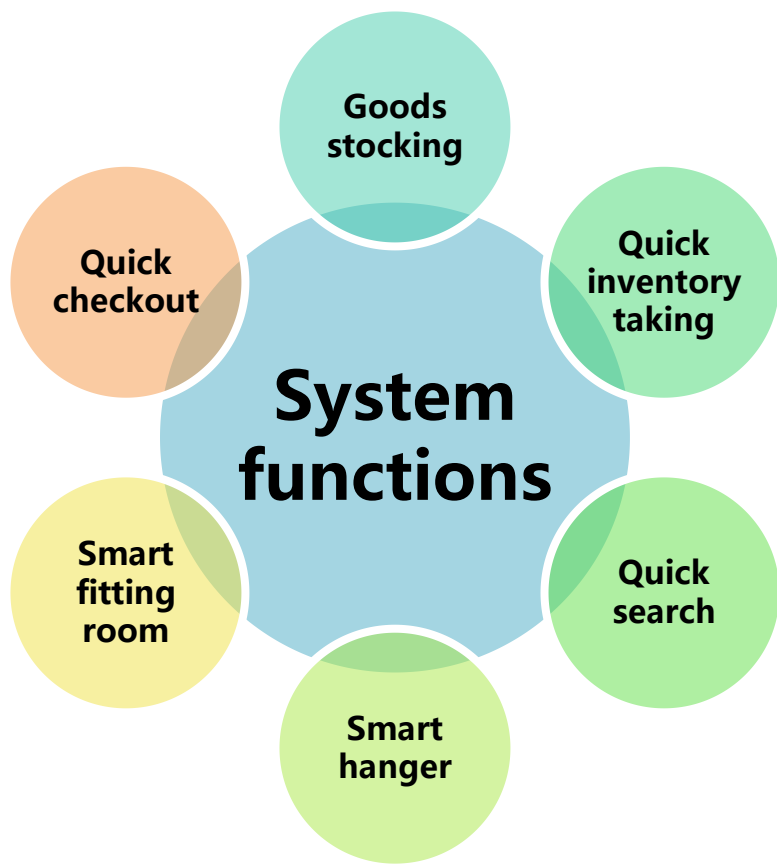
**Labor cost reduction, operation time reduction,  
inventory taking efficiency increase by 300%!**



## RFID-based smart store solution system structure

Smart retail management system uses a next-gen RFID technology. It provides branded businesses with new retail solutions as intelligent stores, future stores, intelligent payment and experience terminals, creates the intelligent shopping environment. Customers can experience the intelligent service and shopping brought by technology. Through customers behavior analysis, products layout and activities are adjusted in real time to improve store sales and goods turnover.





### Goods stocking

Before goods enter a store, a handheld RFID scanner batch reads data on clothing tags, compares with the warehouse receipt, checks the quantity and model of the goods, then errors are corrected manually.

### Quick inventory taking

A handheld scanner collects clothing tag information and sends it to the backend server to compare the data, the differences appear on the scanner screen in real time. After a manual check, inventory information is updated to the back-end server through the handheld scanner.



## Smart hanger

Smart hanger is not only a marketing tool displaying information on countless products, it also collects customer's behavior data.



When a customer takes clothing off the hanger, the smart hanger automatically identifies the tag on the taken item, and the information on style, color, price etc. shows up on the display. At the same time, customer's behavior data is uploaded to the server. Through software analysis and statistics, we can get the clothing **pick up rate** and know which smart hangers **attract** customers' attention **most**.

## Smart mirror

Basing on the virtual video technology, with a smart mirror you can have new clothing experiences without even trying clothes on. It greatly improves consumer experience.



If a customer is interested in an item, but doesn't want to try it on, here comes the smart mirror. The customer needs only a few simple steps to get the appearance of clothing on the body. It is convenient, fast, and also has a great sense of technology. Using the system, data of these customers' experience behavior can also be uploaded to the server to form **strategic data**.



## Smart fitting room

Smart fitting room combines RFID technology with personalized smart payment terminal to provide customers with high-tech experience services

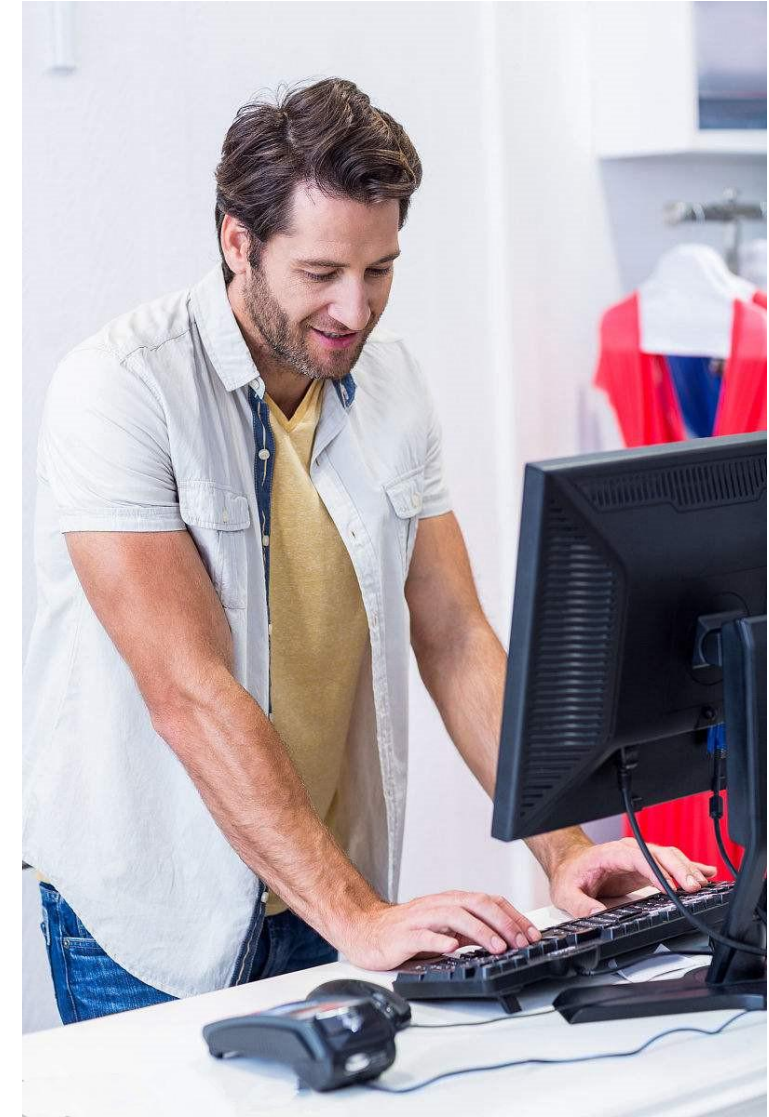


When customers bring clothing with an RFID tag to the fitting room, RFID reader-writer automatically identifies the clothing. At the same time, the data is delivered to the backend server which responds with clothing information. Customers can see the information on other colors, sizes, stock etc. Using a touch screen, they can also pick associated items recommended by the system, order services and ask the assistant to send the selected items to the fitting room. These behavior data can be automatically collected using RFID to analyze clothing **try-on rate**.



## Quick checkout

Using RFID to identify target information automatically, you only need multiple tags to be within the scope of a receiver to be read all at once. It can realize simultaneous identification of multiple goods, improve checkout speed and customer satisfaction.



## Security and anti-theft function

Security and anti-theft system of a smart store integrates an RFID multisystem. It can provide clothing stores with theft protection and also serves as a checkpoint for new goods arrival and orders. It improves work efficiency and avoids repeated investments.



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### ➤ **Reliability**

Key features of an RFID electronic tag itself are big storage, high reliability, ecofriendliness etc.

Electronic tags are developed according to the specific environment starting from properties and technology. They are reliable, magnet proof, water proof, static free, unwearable and have other advantages.

### ➤ **Maintainability**

System software supports upgrade maintenance. To keep up with the constant change and increase of customers' needs, the software reserves extendable functional modules to facilitate maintenance in real time.

### ➤ **Real-time mode**

Warehouse in/out goods are registered, goods circulation accelerates, easy to manage in real time.

### ➤ **Accuracy**

Based on inborn advantages of RFID, tag data is all good in advance. Moreover, reader-writer gets tag and related information in a non-contact way. This avoids human input errors, greatly reduces data error rate, and can help reach 100%.

### Store mgmt.

- Stock-in inventory
- Shelf inventory
- Staff attendance check
- Smart checkout

### Smart access control

- Security mgmt.
- VIP mgmt.
- Customer traffic statistics system

### Business data

- Store display hot area analysis
- Customer flow analysis
- Best seller analysis
- Customer preference analysis

### Tech experience

- Smart fitting room
- Smart selective purchase

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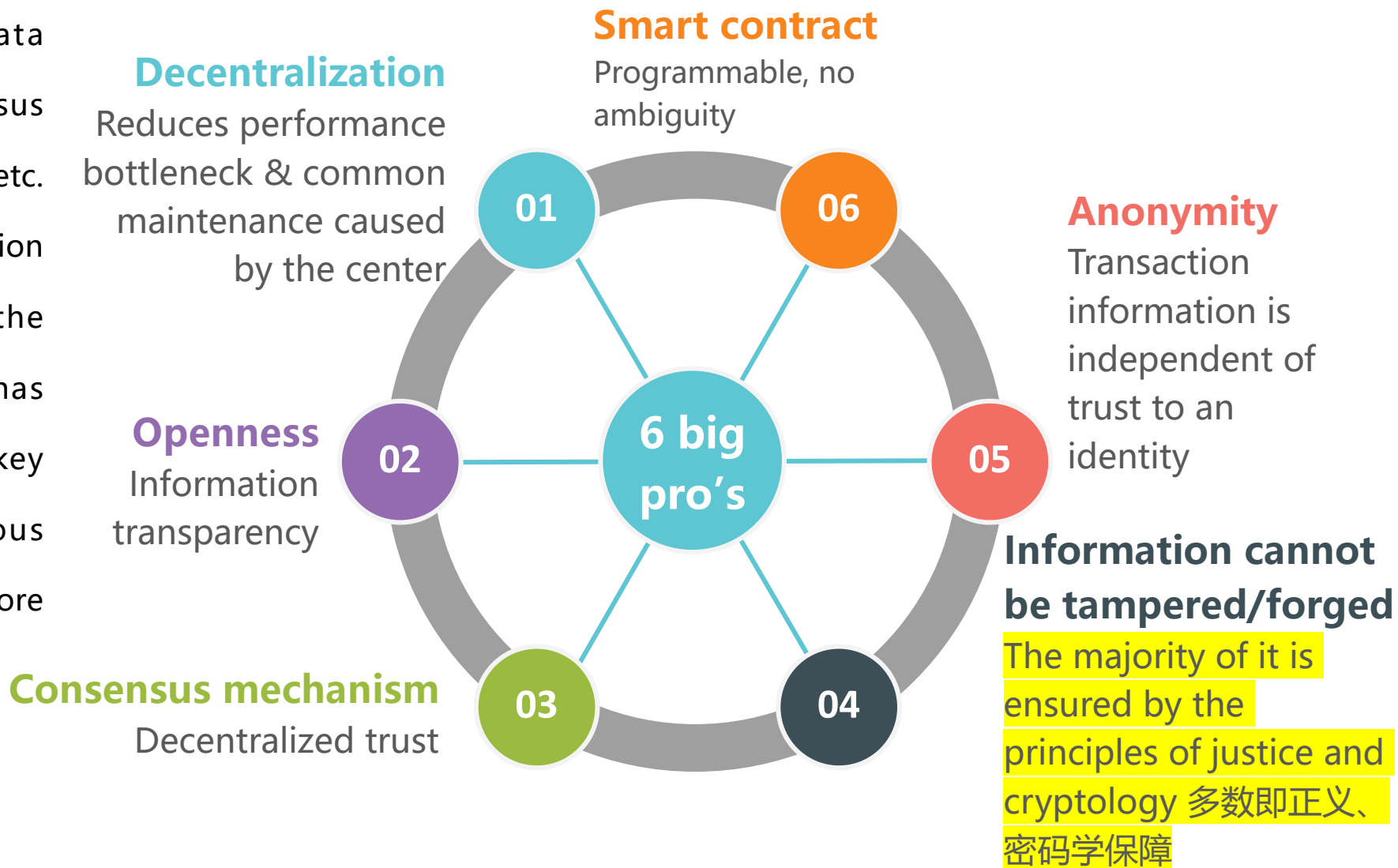
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## Blockchain 2.0 concept

Blockchain has a distributed data storage, p2p connection, consensus mechanism, encryption algorithm etc. new computer technology application models. Its 2.0 gen apart from the original consensus mechanism has programmability as the second key feature. Now according to various business demands, it can create more precise smart contracts.

## Blockchain 2.0 pro's







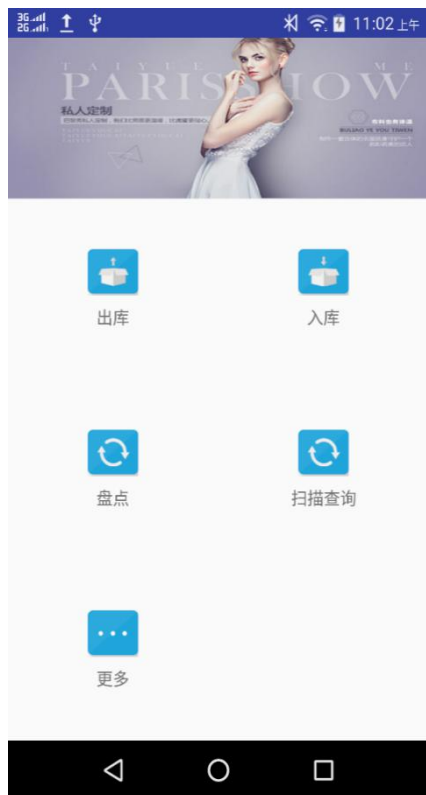
### Rationale

Take goods production link for example. When garment production is finished, its related attribute information is written to an RFID tag. The product information is stored in manufacturer's data center after scanning with an RFID scanner linked with the control supervisor PC terminal. Then, through transfer to a smart contract, manufacturer releases the product information in the form of transactions. Here product related data is loaded to the chain. Warehouse in and out, logistics, store sales, product return/exchange etc. product data are loaded to the chain for storage. It facilitates manufacturer cooperation to reduce the base cost and further to achieve product tracing, anti-counterfeiting etc.



## System effect

With blockchain, consumers can trace the source of clothing by scanning a QR code on the label to identify the authenticity of the goods.



**1 Building the whole process information chain:** Using blockchain and shared consensus, a public ledger is established. It is the only, traceable, tamper-resistant information source approved by the participants. It avoids complex information interactions between various systems and performance bottlenecks caused by conventional centralized servers. It also saves cost of equipment (for network nodes), and the data is maintained jointly.

**2 Process simplification, benefit increase:** Through integration of RFID technology and open data ownership, funds and information flow of clothing production, logistics, warehousing, sales and other levels is no longer mutually opaque. A lot of time and base cost money can be saved, and as a result, benefit increases.

**3 Data security:** The consensus mechanism is used to establish trust to unfamiliar nodes of a p2p network. Besides that, the cryptographic method is used to guarantee the security of the data and other security attributes.

**4 Data traceability:** Many problems caused by conventional data opaqueness are solved; all links of clothing lifecycle can be traced back. If any problem appears, it can be verified accurately and quickly, which strengthens the enterprise brand image.

A large, light blue world map composed of small dots, serving as a background for the central text.

# Thank you

The global decentralized commercial VloT ecochain

Building a commercial ecochain with the perfect combination of the real world and the blockchain

Leading humanity to a reliable and digitalized life

We create the new era of Value Internet of Things

<http://www.waltonchain.org>