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## Analysis on informatization building of logistics enterprises on the basis of shanghai chattel mortgage platform

Sang Xiaojuan<sup>1,2\*</sup>, Zhao Min<sup>1</sup><sup>1</sup>Business School of Hohai University, Nanjing 210098;<sup>2</sup>School of Economics and Management of Nanjing Xiaozhuang University, Nanjing 211171 (CHINA)

E-mail : lsqsxj@sina.com

### ABSTRACT

In recent years, under background of downturn real estate, the events of chattel mortgage problem were frequently exposed due to capital flow breaking in many regions. In order to resolve the problem of dissymmetry of chattel mortgage information, Shanghai banking sector try chattel mortgage platform at beginning of 2014, this innovation was mainly analyzed by media and scholars via viewpoint of banking. This paper attempts to analyze the platform via viewpoint of warehousing enterprise informatization building, to analyze the information requirement of the platform to warehousing sector, demonstrate the importance of compatibility between warehousing enterprise information system and platform, and provides strategy for informatization building of warehousing enterprise chattel mortgage by aspect of software and hardware.

### KEYWORDS

Shanghai chattel mortgage information platform; Warehousing enterprise; Informatization building; Warehousing enterprise information system.



## FOREWORD

Chattel Mortgage is the main channel of steel trading enterprise's financing from bank, the steel trader mortgages its steel material to bank to derive loans. In recent years, the events of chattel mortgage problem frequently occurred in domestic, the most serious situation is the steel material chattel mortgage event burst out in Changjiang Delta region of Shanghai, Jiangsu, etc, as well as the regions spreading from Qingdao Port. From the end of Aug. to end of Sep. 2012, Shanghai regional court had tried over 30 cases related to steel material repeated mortgage<sup>1</sup>. Such behaviors lacking good faith incurred very serious destruction to image of whole sector, and its negative impact is far and deep. Some large scale steel traders and steel production enterprises even transported the steel material stored in Shanghai to external region by adding transport cost, without warehousing in Shanghai.

Upon the situation of steel material mortgage sector suffering heavy strike, the first chattel mortgage information platform of China, i.e., Shanghai Chattel Mortgage Platform was tried in the early of 2014, the steel material mortgage is the cut-in point of platform, to spread to each type of chattel mortgage business, through full risk control to chattel mortgage business, the credit risk of banking is dropped. This platform comprehensively absorbs and applies advanced information technologies as cloud computing, real time monitoring, electronic bill, etc, and converge these scientific and information technologies into various processes of chattel mortgage financing management as warehousing supervision, cargo control, warehouse receipt management, information issuing, etc, information supervision runs through whole process of chattel mortgage and covers the whole field, this breaks through the problem of dissymmetry of chattel mortgage. Through strict supervision to warehouse and mortgage object, it finally and effectively prevent from the problems as repeated mortgage and false mortgage, etc which incurs steel material mortgage risk.

For chattel mortgage in domestic, the banking plays the main role, chattel mortgage information platform is jointly established by Shanghai banking sector, so that the banking can enhance review and realize information share among banks. In the financing mode with participation of three parties as banking, warehousing enterprise and financing enterprise, participation of warehousing enterprise is inevitable, and the cask effect shall occur if only emphasizing advancement of information for banking. In fact, multiple modules of the platform have the information management tracing of warehousing enterprise, e.g., it is stated in platform that, if the steel trader wants to acquire financing from banking via steel material mortgage, the steel material shall be registered in the cooperation warehouse of the platform, the contacting between cooperation warehouse and platform also adopts information means, interaction of information shall to the greatest extent reduce the manmade intervention. Among whole process of chattel mortgage there are many such information interactions, it means that the final effect of information platform cannot leave the information participation of warehousing enterprise. The participation of warehousing enterprise is just an auxiliary role to benefit from chattel mortgage market led by the banking, and this is an advisable selection for improving building of own information system in contrast with information platform led by the banking. Otherwise the effect of chattel mortgage information platform shall be weakened, and cooperation relation between warehousing enterprise and banking shall be impacted without win-win effect<sup>2</sup>.

Shanghai Banking Chattel Mortgage Information Platform is the first innovative mortgage information platform, this innovation is a new trial for enhancing cooperation between banking sector and warehousing sector, and explores new thinking of controlling chattel mortgage business risk. It presents the new dynamic status of chattel mortgage sector supervision and also presents new direction of chattel mortgage management. Under this background, warehousing enterprise needs to adjust direction of informatization building, enhance effective management to own system resource, and also improve connection between enterprise information system and mortgage information platform. In this paper, Shanghai chattel mortgage information platform is taken as an example to understand the function requirement of mortgage information platform to warehousing enterprise, so that the warehousing enterprise can be connected with mortgage information platform when building enterprise information system, to reach the requirement of system compatibility, and finally play its own role in the warehouse receipt mortgage market.

## Overviews of functions of Shanghai Banking Chattel Mortgage Information Platform

The general purpose of Shanghai Banking Chattel Mortgage Information Platform is to drop operation risk of chattel mortgage business, standardize and perfect financing sequence, and re-establish confidence to finance sector. Shanghai banking sector trade association authorized Dongfang Steel to operate the platform, the first batch 14 banks participating in this platform include Construction Bank of China, Shanghai Pudong Development Bank, Bank of Shanghai, ICBC, Agricultural Bank of China, CHINA CITIC BANK, Bank of Hangzhou, etc, together with 56 cooperation warehouses. The function of mortgage information platform is mainly to satisfy the demand of banking to mortgage information, and mainly serve the enterprise financing business of steel traders, etc. The platform provides services as mortgage information registration, resource information query, integrated information query, warehouse stock dynamic status information capture, etc. In order to realize overall information coverage and realize “strict management, good control, easy use”, the platform incorporates the information of warehousing enterprise into system, to realize connection with information of warehousing enterprise and effectively supervise the cargos.

## Analysis on modules of Shanghai Chattel Mortgage Information Platform

The platform is divided into five modules, i.e., mortgage registration, warehouse receipt registration, real object supervision, warehouse receipt financing and warehouse receipt trading, hereinafter the platform shall be respectively analyzed subject to these five modules.

### Mortgage registration module

During daily operation of economic management, some data are usually placed into data files, together with related processing subject to demand of management. The modern database management thinking is to input related data (via the form of encode) into information system, to realize automatic management via computer. The advantages of database management include data share, reduction of data redundancy, maintaining independency of data, centralized control of data, and ensuring security and reliability, and failure recovery, etc of data. All related data are inputted to information system, to realize automatic processing function of information system, and this is the precondition to realize database management. Among chattel mortgage business, at first related information data of banking, warehousing enterprise, financing enterprise and mortgage object shall be inputted to information system. The database management effect shall be better, and capability of controlling chattel mortgage risk shall be stronger, provided that these data are more overall and detailed. Shanghai Chattel Mortgage Information Platform to the greatest extent incorporates various related information into system considering of possibility of acquiring information and ensuring effectiveness of management. These data are independent and mutually correlated, they are static but also dynamic, related information shall be timely compared to identify the false/trueness thereof, and fully play the function of mortgage information platform, at the beginning of mortgage link the risk shall be effectively controlled to conquer the hidden trouble of repeated mortgage. The detailed mortgage registration process is shown in Figure 1:

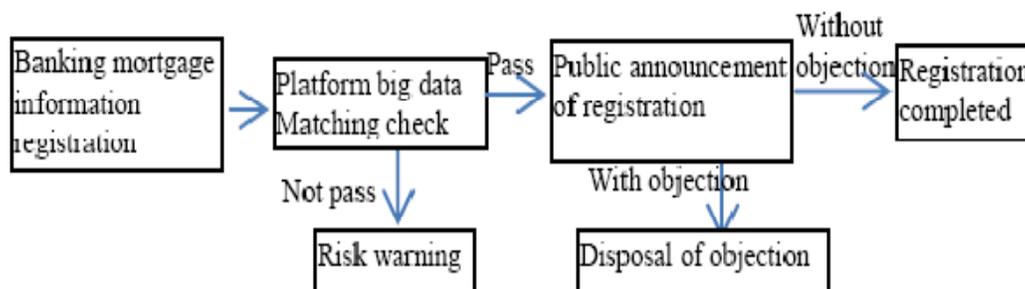


Figure 1 : Mortgage registration process

The process of Figure 1 shows that, the banking plays the main role in the platform, the first step of process is banking registration, the bank with mortgage business is incorporated into mortgage system via registration. In reality the competition of banking market is fairly severe, with possibility of rule-breaking operation by bank, after registration of general information of bank, the platform shall conduct matching check via platform big data, the one passing the check can be done by subsequent operation, otherwise rejected. For newly added bank, the system does not have related data for comparison and supervision, therefore subsequent external information supervision step is added for the system, through public announcement, the bank with defect cannot enter mortgage system.

#### Warehouse receipt registration module

The warehouse receipt is the evidence issued by keeper after receiving the warehousing object, with which the depositor can withdraw the warehousing object. It can be deemed as the evidence of receiving and withdrawing warehousing object. There shall be two conditions for warehouse receipt taking effect, one is that the keeper shall sign on or affix stamp on the warehouse receipt, the other is the warehouse receipt shall include certain legal recording items<sup>3</sup>. The electronic warehouse receipt is the electronic form of traditional paper warehouse receipt, in the information platform, electronic warehouse receipt is the carrier of platform ownership registration, mortgage financing, warehouse receipt trading, and the creation process is shown in Figure 2.

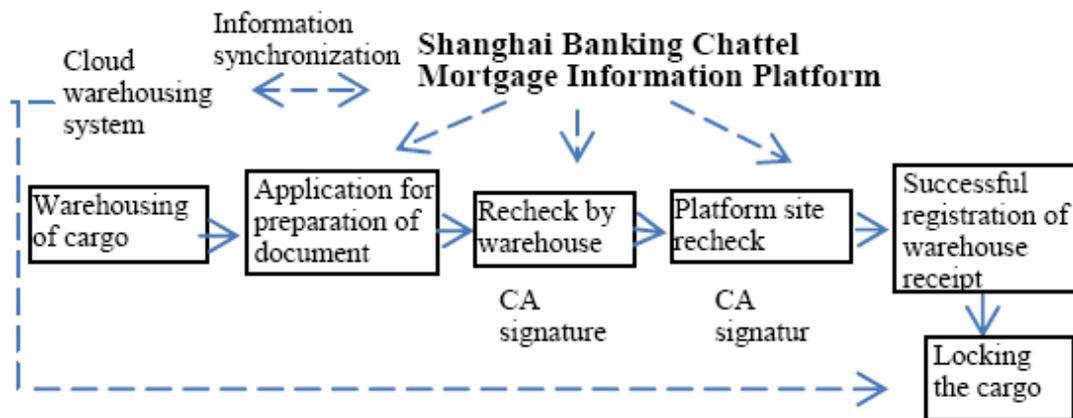


Figure 2 : Warehouse receipt registration process

The process of Figure 2 shows the creation of warehouse receipt with participation of warehousing enterprise, mortgage information platform and cargo owner, they are mutually related and mutually restricted. After warehousing of cargo, warehousing information is recorded via cloud warehousing system, furthermore, the platform shall also synchronously participate in input of warehousing information, to share the related mortgage object information of warehousing enterprise at the platform. During previous operation processes, since there was no supervision by third party, the warehouse receipt may be fudged by cargo owner and warehousing enterprise, in the process setting of the platform, the warehouse receipt shall only be created via joint review of warehouse and platform, which in some extent restricts the randomness of warehousing enterprise fudging the warehouse receipt. After creation of warehouse receipt, the cargo owner can initiate warehousing service request on the platform. In order to guarantee trueness and effectiveness of warehouse receipt after registration, the receipt making and application process shall pass two reviews of warehouse and platform, only after review of warehouse and platform is passed, shall the warehouse receipt be successfully registered, furthermore, cloud warehousing system shall lock the cargo, the cargo after successful registration of warehouse receipt shall not be out of warehouse at will. On the basis of cloud warehousing management system and warehouse and supervision review, the platform shall ensure that the cargo shall one by one correspond to registered warehouse receipt, the warehouse receipt registered by the platform shall be the exclusive and effective digital evidence of cargo. The warehouse receipt registration of cargo shall

support the chattel warehousing, supervision process, chattel trading and financing business cargo right and pledge right ownership registration, to ensure that any ownership change can be traced and evidenced.

#### Supervision module of real object

After warehousing of cargo, the warehousing enterprise shall supervise the mortgage object, and this is the most basic and professional task of warehousing enterprise. During this period, the cargo keeping risk of warehouse keeper includes three aspects: (1) Risk from natural property, package, and warehousing facilities conditions of cargo, such as rusting of steel; (2) force majeure, such as cargo loss from earthquake; (3) Manmade risk from inappropriate enterprise management regulations and measures, duty breaking and low moral level of employee. The manmade risk is at present the one with most difficult management, especially during in batches mortgage-release of chattel mortgage business, the situation of taking substandard products as fine products often occurred, thus the difficulty of supervision is increased. Shanghai Banking Chattel Mortgage Information Platform positively participates in this link, and to the greatest extent involve the warehousing enterprise in the supervision, with many years' industrial experience accumulation and professional resource configuration, the cloud computing warehousing management system of uniform layout, multi-element supervision means, perfect supervision system have been established for the platform, forming the mortgage control system of "technical protection+ personnel protection", to thoroughly eliminate the supervision blind area and ensure that the risk of mortgage cargo in warehouse can be controlled. During mortgage object supervision period, the platform shall conduct system level "freezing" to mortgage object, when the bank or client proposes the instruction of releasing the mortgage, the platform shall send to cloud computing warehousing system the instruction of "defreeze", to release the supervision of real object, and the detailed process is shown in Figure 3.

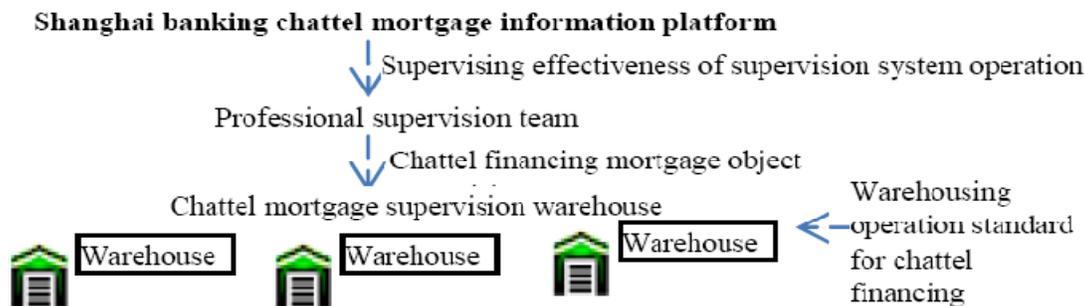


Figure 3 : Real object supervision process

The above process shows that, the platform realizes vertical management to warehousing enterprise, the professional supervision team is established to supervise the warehousing enterprise, and strip the right of warehousing enterprise of at-will in/out of warehouse, and compress the cheating space of warehousing enterprise and financing enterprise.

#### Warehouse receipt financing module

The above three modules are in fact the fundamental modules to reduce financing risk, warehouse receipt financing module is the financing business execution module. In this module, the financing enterprise, bank and warehousing enterprise have frequent interactions, and successively complete the financing process, it is mainly to complete the process and supported by risk control, among the process, the information is mainly of circulation. The process successively has 18 steps comprehensively explaining the warehouse receipt mortgage mode. At first the depositor or financing party store the cargo into certification warehouse of the platform prior to financing, to register the warehouse receipt; warehouse receipt registration is successful; financing party initiates mortgage financing to bank on the basis of electronic warehouse receipt; the bank reviews and accepts the warehouse receipt mortgage, the real object is locked in the designated warehouse for real object

supervision; the bank releases loan to financing enterprise; the financing enterprise pays off related loan to bank; the bank releases mortgage of warehouse receipt; related real object can be released, the platform notifies third party supervision institution to release the supervision; related cargo can be out of warehouse<sup>5</sup>. Detailed process is shown in Figure 4.



Figure 4 : Financing process of warehouse receipt

This process ensures that the mortgage object is all in the controlled status prior to and after mortgage, and realizes the full matching between warehouse receipt and real object, to effectively resolve the problems as repeated mortgage and mortgage object out of control, etc. The platform also has other auxiliary intelligent functions which not only provide warehousing grading service but also have related database to provide decision support for bank.

Warehouse receipt trading module

The warehouse receipt is adopted to present the delivery request right of depositor or warehouse receipt holder to warehousing object, therefore it is valuable security. With developed finance business at present, the value of this valuable security shall be re-designed and adopted, this platform is set by warehouse receipt trading module. The depositor stores the trading cargo into platform certification warehouse, through the platform the electronic warehouse receipt is created and registered, i.e., the listing trading can be conducted on the bulk commodity spot trading platform, after the trading is successful, the warehouse receipt shall be at real time transferred at trading platform and chattel mortgage information platform, as shown in Figure 5.

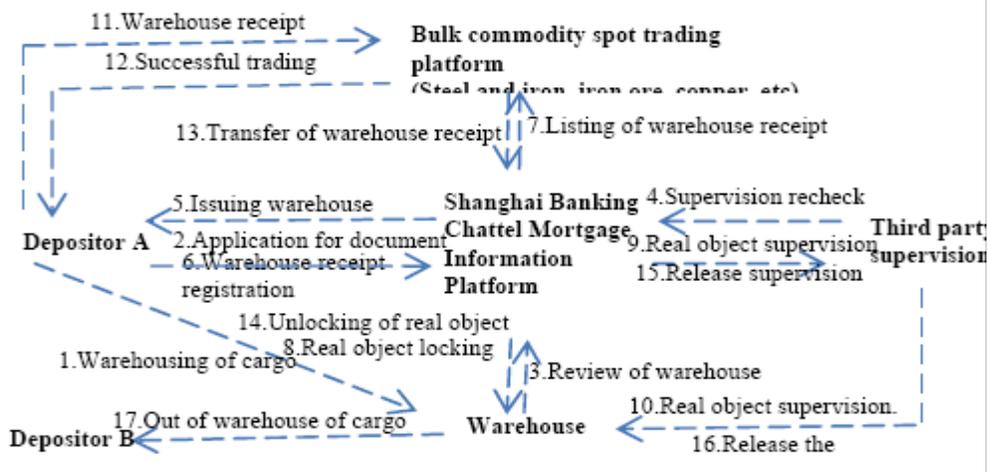


Figure 5 : Warehousing trading process

The electronic warehouse receipt (formed on the basis of platform) bases on clear ownership registration and is supported by strict real object control, and this shall greatly promote the stable development of bulk commodity spot trading. During the process of warehouse receipt trading and listing, the platform shall be responsible for full process cargo supervision, and ensure clear ownership of warehouse receipt for trading, and guarantee the quality of completing warehouse receipt trading.

## **Propose the strategy of warehousing enterprise informatization building on**

### **The basis of shanghai chattel mortgage platform**

Shanghai banking sector chattel mortgage platform is the new product of mortgage sector, its development shall also be further proven by the market. In the future with increasing demand of financing by small and middle enterprises, chattel mortgage shall have greater and greater market vital force, and business scope shall be wider and wider. With appearance and application of new technology and prompt network development, the step of chattel mortgage business informatization shall never be stopped, and this is the orientation to be adhered to by warehousing enterprise developed with chattel mortgage business, i.e., the chattel mortgage business information platform shall be adopted as basis to speed up building step of chattel mortgage business informatization, resolve the problem of dissymmetry of information, and realize cooperation and win-win with bank and financing enterprise. In order to realize this goal, informatization building of warehousing enterprise shall enhance enterprise culture building, stick to principle of good faith, at the same time the software and hardware shall be improved, to own the gain its position in the chattel mortgage market.

Make clear the value of credit and stick to principle of good faith

In the chattel mortgage business, the warehousing enterprise is the entrusted responsible person of commercial bank. Nevertheless, in China's warehouse receipt mortgage market, many warehousing enterprises do not play this role very well. As the middleman for financing enterprise and bank, they sometimes provided false data to bank for the purpose of attracting customer, and mislead the bank to make wrong decision, and such enterprise was finally rejected by the bank. It is a typical near-sight behavior of ignoring the value of credit and shall inevitably be rejected by the market. The traditional chattel mortgage supervision had a loose supervision, some warehousing enterprises had the idea of leaving things to chance and risked danger in desperation to cheat the bank. In the supervision system of information platform, such idea of leaving things to chance shall be difficult to succeed. This platform strictly controls each role participating in chattel mortgage, and even the bank in leading position. According to above mortgage registration module, information is permeated to inside and outside of system, credit record can be traced to the past time and future. Although the module does not have the existence of warehousing enterprise, the process setting can present that, making fraud information shall only bring about one's own destruction. The system can be entered only by conforming to regulation, cherishing own credit standing, and this is the requirement to bank and also to warehousing enterprise. Therefore, during own informatization building process the warehousing enterprise shall pay attention to value of credit and stick to good faith principle.

Perfect information share

The information share shall do well following items:

(1) Information share scope is mainly to satisfy platform demand

The warehousing enterprise is an independent operation entity with fairly wide business scope, the information management system covers all personnel, property, object in the enterprise, and also involves the issues of business secret, therefore during share of information with outside, all information share shall not be allowed. The data share on the chattel mortgage shall be sifted, considering of cost and safety, and according to requirement of mortgage platform, the risk control of mortgage business and unblocked operation of work shall be guaranteed.

Taking warehouse receipt financing module of platform as an example, warehousing enterprise needs to share the following information: first, general information of warehousing enterprise to prove the business capability of warehousing enterprise, such as enterprise scale, equipment facilities, finance

and management, enterprise credit standing, etc; second, related documents (with legal status) entered into between bank and financing enterprise as well as third party supervision institution, such as warehouse receipt mortgage loans third party cooperation agreement, guarantee for assisting bank for performing mortgage right, cooperation warehouse certification authorized by platform for the warehousing enterprise, these documents prove the legal status of warehousing enterprise, and play the effect which is similar to contract in reality, when legal conflict is encountered, the legal responsibility shall be undertaken subject to related laws; third, related information of mortgage object and supervision, such as cargo type, quantity for in and out of warehouse, time for in and out of warehouse, stocking quantity of cargo, utilization situation of warehouse, equipment operation frequency and service life, work staff information (work content, work time, attendance check, leave job time, etc); finally, other information required by platform, e.g., some platform has high intelligent requirement, detailed review indexes, and may need the history data of warehousing enterprise and financing enterprise.

At present, the warehousing enterprise with capability of carrying out mortgage business all has fairly high information management level, taking CMST (with success in China) as an example, its information system basically has 7 functions, i.e., business management, safety management, data management, cooperation management, general information management, equipment management and electronic map, etc, before related information are sifted from these modules for share with outside, the system shall pre-process the information, classify and process the information acquired or sent, the information are distributed to different function modules of system for processing therein, considering of information efficiency and safety, the platform shall be authorized by different information share levels.

#### (2) Seamless connection between information module and outside

During informatization process, the information development technologies selected by each enterprise are diversified subject to consideration of factors of cost, sector characteristics, management requirement, etc, due to problem of obstacle of information share among systems caused by information development technology standard, the information share between warehousing enterprise information system and Shanghai Chattel Mortgage Information Platform also has this problem.

Completing simple data interaction among different systems has fairly high cost, the cost of interaction shall be dropped by only adopting standardized specification, perfecting article encode system and speeding up technical development and support, so as to drop cost of interaction, and improve interaction and share effect<sup>6</sup>.

For warehouse receipt registration module of Shanghai Chattel Mortgage Information Platform, warehousing of cargo needs to record warehousing information into database, in reality, REID reader automatically identifies the label stuck on the mortgage object, a problem shall occur during identification process, i.e., different RFID standard system corresponds to different encode standards, under different encode standard, encodes of identification technologies of each sector are not fully unified, and adopting uniform encode may also bring about unnecessary troublesome <sup>7</sup>to small financing enterprise, thus warehousing enterprise needs to compile encode internally, and adopt software method to realize virtual/actual identification technology of cargo, cargo position, and work staff, to encode, acquire, analyze and process<sup>8</sup> the information drawing attention of enterprise.

In reality, when the cargo is sent to warehouse, related data shall be recorded in database, and it is required to check whether the database of warehousing enterprise is compatible with database supported by Shanghai Chattel Mortgage Information Platform. Heterogeneous database shall incur problem of information interaction and share, therefore this problem shall be resolved when warehousing enterprise constitute the database.

#### (3) High quality of share information

In the business of chattel mortgage, warehousing enterprise is responsible for supervising mortgage object, the traditional supervision was usually that, after some unfavorable event occurred, the bank then knew about related information from warehousing enterprise, the bank lost the opportunity for timely remedy due to delay of information. On the other hand, without real time monitoring, the warehousing enterprise may do something impacting benefit of bank, with advantage of its present at site for the first

time and there is nobody timely carrying out prevention action, it may do some unfair event. For example, the warehousing enterprise and financing enterprise may transfer the mortgage object and take substandard products as fine products.

In the real object supervision module of Shanghai Chattel Mortgage Platform, real object supervision of professional supervision team to warehousing enterprise is set, such setup can promote supervision work of warehousing enterprise. The supervision of professional supervision team shall depend on the warehousing enterprise's sharing real time data of warehousing on the platform, so that the warehousing management behavior is directly in the supervision scope of supervision team. According to information technology, such supervision technology has been adopted by many sectors, i.e., the Internet of things technology. The Internet of things technology has the general characteristics of all sided perception, reliable transfer and intelligent processing, and can connect any article with Internet, to realize information exchange and communication, and realize intelligent identification, positioning, tracking, monitoring and management<sup>9</sup>. The Internet of things technology can be adopted to acquire the natural physical information of temperature, humidity, etc in the warehouse via digital form and transmit it to system software, and can also summarize various network technologies as multi jump mobile radio network, sensor network, WIFI, etc<sup>10</sup>. The Information in a large scope are integrated together to carry out supervision, dispatching and privilege management to personnel, forklift, tray, shelf, etc in the warehouse, to realize reasonable arrangement and control. At the business links which can easily incur supervision leak, e.g., in and out of warehouse, warehousing shift, and inventory check, etc, the Internet of things technology is adopted to improve and optimize the cargo, and avoid the shortcoming of traditional warehousing.

#### Hardware configuration

The warehousing participating in chattel mortgage is not the warehouse and warehouse management of traditional significance, it is warehousing of logistics finance system, its task is not only to keep well the mortgage object, but also to accept the real time monitoring and supervision by client, to minimize the dissymmetry of information. In order to reach monitoring effect, the modern advanced hardware configuration is inevitable.

At first related monitoring equipment shall be mounted at door of warehouse, to monitor the cargo and personnel. Each door is set by sensor, the door of different role shall be mounted by different sensors, at the main entry/exit with in and out of cargo and personnel, RFID door reader shall be mounted to identify and supervise the in and out of work staff and cargo; at the side door and small door with seldom utilization (such as safety exit, etc), infrared sensor shall be installed to supervise the illegal in and out of unconcerned personnel.

Inside of warehouse shall be fitted by apparatuses for supervising warehouse environment, personnel, equipment and cargo. The temperature sensing label, humidity sensing label, optical sensing label, etc shall be configured, and related card reader shall be added to supervise the environment of warehouse, and facilities and equipments shall be adjusted and controlled as per related stipulation, so that the environment can satisfy the demand condition; The personnel in the warehouse is configured by RFID label work clothes and fitted by PDA, forklift, etc is installed by Onboard card reader in favor of dispatching personnel and equipment when arranging work task, if the task is urgent, work staffs and equipments at nearby shall be selected; if the task is not urgent, the staffs and equipments shall be selected subject to operation skill of work staff and service life of equipment, to realize reasonable arrangement and utilization.

Electronic map shall be configured to at real time simulate and display the position situation and staying time of warehouse cargo position, cargo, personnel and equipment, to conduct supervision and management. According to supervision of time and position, staying time of equipment and work staff shall be controlled, to exchange information with outside at real time, and enhance transparency of information.

In addition to transmitting related information on various tools and devices, the microphone, electronic screen, electronic road sign, etc shall also be adopted for information transmission and task guiding, to avoid problem or omission during work.

After configuration of these hardware, through system connection they shall be directly led into platform system, through networking between SAAS mode cloud computing warehousing management system and warehousing enterprise, the supervision team can directly capture the dynamic information of warehouse, and at real time supervise the dynamic status of stocking in the warehouse.

### Ending word

The information platform is a system, each subsystem involved in this system shall be of mutual connection and mutual effect, the bank strives to realize good development of warehouse receipt mortgage, the logistics enterprise shall also undertake its responsibility. Establishing Shanghai Banking Sector Chattel Mortgage Platform shall play the demonstration effect to development of chattel mortgage sector, and also indicate the direction for informatization building of warehousing enterprise. In order to adapt to development trend of warehouse receipt mortgage, the warehousing enterprise shall be positively incorporated into information platform system, and follow the requirement of information system, to improve the linking extent with platform via information building, only in this way, shall the warehousing enterprise have more market opportunity and provide better service.

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