

Dimensional Barcode Integrated Application Platform--Solution for Beverage Industry

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Abstract. This paper discusses the industry two-dimensional bar code technology in the beverage industry solutions, to solve specific problems in practical production, manufacturing, sales for the topic, starts from the technical characteristics, advantages of overall design concept and the specific solutions are described in detail

Background and Current Situation

A. What is Dimensional Barcode

A dimensional barcode is a black and white graph distributed in specific geometries according to certain rules on the plane (two-dimensional direction) to record data symbol information; it makes use of the concept of bit stream of "0" and "1" constituting the internal logic basis of computer, represents text numerical information with several geometries corresponding to binary system to achieve automatic processing of information through automatic recognition by image input device or photoelectric scanning device: it has some common characters of barcode technology: each code system has its specific character set; each character occupies a certain width; it has a certain check function. It is also characterized by the function of automatic recognition of information on different lines and handling graph rotation changes.

B. Advantages of Dimensional Barcode .High density coding and large information capacity .It can accommodate up to 1850 capital letters or 2710 digits or 1108 bytes or more than 500 characters, the information capacity is dozens of times higher than that of common barcode.

A wide range of coding. The barcode can encode pictures, sounds, text, signatures, fingerprints and other information which can be digitized so that the information can be represented with barcodes; it may represent multiple languages and characters; it may represent image data.

Strong fault-tolerant capability, possessing error correction function .The dimensional barcode can still be read correctly due to local damage caused by perforation, defilement, etc., information can also be recovered when the damaged area is up to 50%. High decoding reliability .It has a much lower error rate of decoding than that of common barcode (two millionths), the bit error rate is within one ten-millionth. Encryption can be introduced .Good confidentiality and security. Low cost, easy to manufacture, durable. Barcode symbol shape and size dimension are variable. Dimensional barcode can be read with a laser or CCD reader.

C. Application Status and Demand of Dimensional Barcode

As complementary three links, logistics, anti-counterfeiting and traceability should play a vital synergy in production, circulation and use processes. But for now, there is no effective technical means which can achieve integrated logistics supervision in production, processing, quality control, sales and consumption processes and effective anti-counterfeiting and check on product information.

Solution for Dimensional Barcode

A. Analysis on Solution Design Idea and Necessity

1) The introduction of dimensional barcode in production

Driven by interests, a lot of shoddy products appear in production process. First, in order to reduce costs, raw materials required in the production process are not selected strictly in accordance with the

requirements. Second, producers simplify the production process and don't produce in strict accordance with the production process. Third, there are health and safety problems in production process. Dimensional barcodes are introduced in the production process of the products for recording information concerned and leave the factory together with the beverages with the dimensional barcodes being embedded on customized package, such as caps, bottles. Two methods are used to encrypt the information recorded by the dimensional barcode. External encryption: code key is used for management so that the dimensional barcode of the same information produced by counterfeiters cannot be read. Internal encryption plays a role on encryption by changing the arrangement of some part inside the dimensional barcode in the procedure of the information generating the particular package.

In this part, dimensional barcode is used for recording the quality of the materials used, the time consumed, the production location, the production environment, the production process and other basic information in the production process so as to make initial records of the authenticity of the beverage. More importantly, it facilitate our customers to understand the beverage production details so that our customers can make a better choice. The goal of drinking assured and pure drinks has been achieved.

2) Using dimensional barcode in circulation

First, strengthen the existing anti-counterfeiting effect .At present, the turnover on market has greatly exceeded the amount of actual production, the market is flooded with a large number of products mixing the false with the genuine. While there are some ways to identify the authenticity, counterfeiting ways are endless, and the counterfeiting means are more and more superb, simple test method is increasingly challenging for consumers. Dimensional barcode can play a role on further anti-counterfeiting in circulation. In the sale of beverages, the dimensional barcode must be affixed on product packaging as certificate of origin. Each anti-counterfeiting label is corresponding to each dealer who is recognized through scanning the dimensional barcode by computer network. This kind of anti-counterfeit labels for origins made through dimensional barcode technology and computer network technology is divided into dealer and customer origin labels. Dealers use anti-counterfeiting labels to supply distributors to demonstrate the purity of their sources of goods, distributors can also use anti-counterfeiting labels provide customers with the appropriate proof. Dimensional barcode delivers information on manufacturers and dealers as well as distributors at any time to potential consumers, consumers also can timely access to information on corporate and products, multi-channel communication between consumers and manufacturers, consumers and the dealers, manufacturers and the dealers is achieved so that the fakes have no place to hide.

Second, the logistics is smoother .Description to it in the storage and transport of goods is essential. Coding, transcription, checking, making an inventory ... All the work in logistics is manual operation, which greatly affects the speed and accuracy of information collection. Using dimensional barcode in logistics, on one hand, eliminates entry errors, on the other hand, the dimensional barcode can also be read even if it is partially damaged. Introduction of dimensional barcode in circulation largely accelerates the circulation and distribution of beverages.

3) Making use of dimensional barcode in product promotion and publicity

Today is the era of information explosion, dimensional barcode is the fastest channel for products online advertising. A small black block has become a platform carrying multimedia information, convenient and quick. Consumers have a greater dependence on the phones, coupled with the popularity of smart phones, mobile internet is in rapid development. Phone dimensional barcode ushers a fast development opportunity, has broad application prospect.

In view of this, beverages companies can take advantage of the breadth of mobile customers and actively make good use of mobile internet, a favorable platform. Build in or promote dimensional barcodes recognition software in users' mobile phones, when users get goods marked with dimensional barcode, they can take photos with cameras on their mobile phones to dimensional barcodes printed on newspapers, magazines, advertisements, books, packaging and business cards, fast surfing the internet, downloading information, understanding drinks associated information and knowing the business operation information can be achieved by scanning dimensional barcode or

entering the numbers below dimensional barcode. Enterprises also send dimensional barcodes containing products advertisements and the related promotion information to customers, which can save space, and is conducive to the transmission of information in many aspects.

4) The introduction of dimensional barcode in service

Adding dimensional barcode on after-sale service card, the after-sale service card has detailed date of production, date of sales and deadline of guaranteeing change of articles or refunding if unsatisfactory. On one hand, it can make customers access to necessary after-sales service simply and conveniently, on the other hand, manufacturers and merchants can better understand common problems existing in products through continuous tracking and analysis on dimensional barcode of products in order to better improve products and service so as to better achieve their products value.

B. Design Principles

Security: secure transmission, storage and access of all data in the system must be ensured; Reliability: uninterrupted and stable operation of the operation service shall be ensured, and exceptions shall be properly handled. Be able to guarantee part of the business can be operated offline; High efficiency: making use of advanced software and hardware architecture ensures high efficient operation of the system; Extensibility: business functions can adapt to the expansion, update and deployment of business needs; Retractable: the performance of the system is able to adapt to the increase, distribution, and balance of the service capacity; Manageability: the system provides remote management function; Easy to use: the system provides a friendly, intuitive user interface, comprehensive support and training education; Advancement: it is necessary to consider the development trend of information technology, the characteristics of the industry are also required to be combined for developing appropriate technical solutions.

C. System Overview

Food beverage and fruit juice processing industry is characterized by large volume, short shelf life, high production requirements, complex process, low degree of automation, etc., how to create a traceability system of the entire life cycle of food from raw materials processing to planting and breeding, acquisition and storage, production and sale is the fundamental measure for food and beverage industry to improve product quality and ensure reliable product quality.

The system uses C / S and B / S hybrid architecture in tracking and managing information on beverage production and circulation. In production, beverage production enterprises add orders through the system, production management subsystem will then automatically receive marking data, in the production process the production terminal software will upload the detected information to the production management subsystem after the beverage packaging labels passing the detection. In supply chain management subsystem, information on raw material fruit quality and quality-related data in production and processing process are collected to establish quality information database, and the product quality are tracked through advanced dimensional barcode recognition technology. With the standardized management of warehousing and logistics, it can not only track the quality of products, but also track the logistics status of the products to enhance data gathering on production sites of food production and processing enterprises, improve product quality management and after-sales service capability, reduce production costs. In circulation, drinks distribution business institutions can use specialized dimensional barcode recognition equipment to read beverages information which can also be checked by entering the unique identification code of the products on the website or via the mobile internet client, SMS, etc.

In summary, dimensional barcode integrated application platform relies on dimensional barcode labelled on beverage packaging, makes use of internet and reading devices to run through all aspects of beverage from raw material purchasing, production, storage to distribution and marketing, brings beverage products information together to a centralized database system to realize management to the entire process of beverage products.

D. Overall Technical Architecture

On division of functions in the application system, five major subsystems and three underlying databases will be obtained respectively. Five major subsystems include production management

subsystem, supply chain management subsystem, marketing management subsystem, code printing subsystem and platform management subsystem.

1) Production management subsystem: this subsystem will gather and manage information on various aspects of production of products, such as product manufacturing, product disinfection, product canning, product testing, etc., it allows business management personnel to obtain information on all aspects of the production to achieve production management.

2) Supply chain management subsystem: this subsystem will gather and manage information on various logistics aspects, such as the logistics, product status, product tracking, traceability, etc. to achieve real-time data collection and information management to the supply chain.

3) Marketing management subsystem: this subsystem will collect and manage information on various aspects of marketing, such as media placement, information inquiry, quality complaints, channel monitoring, identification of users' mobile phones and other aspects, it establishes full circulation of information between products and ultimate consumers to achieve effective protection and management throughout the marketing chain.

4) Code printing subsystem: this subsystem is primarily responsible for the generation and printing of coding in various aspects, and for data exchange through production management subsystem, supply chain management subsystem, marketing management subsystem to form effective production data.

5) Platform management subsystem: this subsystem is primarily responsible for the establishment and management of the right and power distribution, account management, system configuration, etc. of the platform to achieve information configuration and management of dimensional barcode integrated application platform.

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