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Application of electronic commerce intelligent safety management system in sporting events

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ABSTRACT

Nowadays, with the continuous expansion of the quantity, type and size of sport stadiums, more and more high-tech equipments and information systems are used in the management and operation of stadiums and sporting events. ISMS technology has been widely used to manage sport stadiums, and has brought historic changes to the intelligent management of large stadiums. This paper is to analyze the specific application of ISMS in stadiums, especially the face recognition system, working principle and some application cases, in order to provide references for the usage of ISMS in sporting events in the future. A great deal of time and resources will be invested in creating a fantastic spectacle of achievement in this field, but it is vital that the overall risk management should be strengthened by a comprehensive and pragmatic safety plan. The plan covers all aspects of delivering and serving the events and demonstrates the due process in the following areas: the risk assessment and method statement, the management of safety systems, the output of risk analysis, the managing strategies of reducing risks, crowd safety and management, the assessment and safety management of fire risk. © 2014 Trade Science Inc. - INDIA

KEYWORDS

Case study;
Sporting events;
Information system;
ISMS.

INTRODUCTION

Risk assessment is nothing more than a careful examination of hazards associated with activities that people undertake what could reasonably but significantly result in harm or have the potential to cause harm. Those who could be harmed may be employed or not employed by the venue(s). However, at large sporting events, the duty of care extends not only to employees but also to the spectators and volunteers who used to deliver the event. Once the assessment of all the risks has been undertaken, a strategy to control those risks

can be formulated. Controls need to be clear and concise with no ambiguity resulting in confusion and need to work in a manner that they reduce the risk to a point that is tolerable, but not to prevent the activity or stop the activity unless it is actually dangerous to health. In an evolving organization, nothing stands still. An effective risk management policy includes the capacity for re-evaluation and improvement. At a practical level, this will require the nomination of an individual or a group of individuals to the responsibility of ensuring that risk management policies and procedures are up-to-date, as well as the establishment of regular review cycles of

the organization's risk management approach.

Intelligent Safety Management System (ISMS) previously was a British aircraft recognition technology during World War II. As ISMS technology can provide convenience for many business users, and improve operational efficiency, safety and accuracy, it has been used in the area of ticket management^[1]. Access control, library management and other applications gradually begun to apply ISMS technology. In 2006 FIFA World Cup, all 12 venues used the ISMS electronic ticket system. Because of the high security of ISMS tickets, and carrying out the non-contact authentication within 10cm in the short distance recognition device quickly and conveniently^[2], it ensured the audience safe and convenient access to the arena. World Cup tickets embedded with ISMS chips and ISMS reader device throughout the stadium around could identify and track football hooligans, and guarantee the security of the ball game. More and more sporting events apply ISMS applications in a variety of security control systems, desiring to improve stadium safety control. This paper is to analyze specific sporting events cases using ISMS, hoping to provide some reference to us^[3].

THE COMPOSITION OF THE ISMS TECHNICAL SYSTEM

ISMS radio frequency identification system is regarded as one of the ten most important technologies of this century. This technology has existed for a long time, but until the large supermarket chain Wal-Mart in the United States^[4], it required its major supplier merchandise to affix ISMS tags, an ISMS storm started to begin.

Precedents of ISMS technology in the field of sports, the football World Cup in 2006 on the use of ISMS tickets, golf, track and field and other sports also achieved good results. This article aims to introduce the principle of ISMS technology, to analyze the use of the current situation and development prospects in the field of sports, the cause for the domestic sports academic understanding of this technology and to carry out further study of the use^[5].

Electronic tags

The electronic tag is a real vector of the ISMS system. The tags are equivalent to the bar code symbols in

a barcode technology, which is used to store required identification and transmission of information. Each of the electronic tag has a unique electronic code. The electronic tag includes the tag chip and tag antenna, the former for storing data information and tag information of the tag antenna having a role of receiving and transmission^[6]. The electronic tags can be divided into different power supplies based on electronic tags, active ISMS tags and passive electronic tags. Points, from the functional aspects of the electronic tags, can be divided into read-only tags, rewriteable tags^[7] and microprocessor tags. Points, according to the modulation scheme tags, can be divided into active tags and passive tags.

Readers

The reader is responsible for the device to read or write tag information. It can be used alone to complete the reading and writing of data. Displaying and processing functions can also be carried out jointly with the computer or other systems and the operation of the electronic tags^[8]. The typical reader control modules, RF modules, interface modules, as well as the reader antenna. In addition, many of the reader there are additional pick 13 (RS232, RS485, Ethernet interface EI, etc.), so that the obtained data is passed to the application system, or receive a command from the applica-

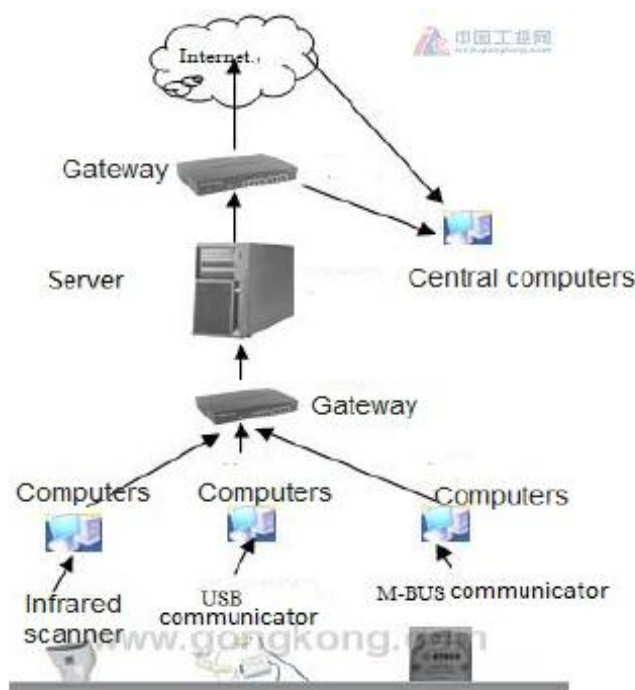


Figure 1 : ISMS technology system elements

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tion system.

Data management system

The data management system can complete data information storage, management, analysis, and control electronic tags' reading and writing. The data management system can be a database or supply chain systems of various sizes.

OVERALL SYSTEM DESIGN

Application integration tools for integration of application systems With respect to system integration, it introduces the concept of base application platform and uses mature integration tools, e.g. workflow tool, report tool, data exchange tool, data transmission tool, etc. On the basis of integrating such tools, it also provides application systems for integration of personnel, information, processes, etc. This enables the system to share information and coordinate management with other operation systems of the Golden Shield Project and Golden Gate Project. Advanced application design mode can direct the development of applications. As to the system architecture design mode, it uses the MVC and provides technical designs for business data display layer, business logic control layer, business data access layer and business data storage layer, from three perspectives of display, control and data access.

Constructing system management model the information management system is modeled according to its operation management contents. The inherent relationships among operations and operations application deployment are briefly described, mainly designing the core application functions of the system. With respect to application functions, the designing core functional modules and functions should be included. Design is refined according to actual requirements and management highlights. Integrate system according to application characteristics. With respect to system application deployment, integrate and optimize the system by region and level according to operation characteristics and objects of service. Scientifically design the system with reference to CMMI 3 software process model. The system development model is designed in strict compliance with CMMI 3 software process model from such perspectives as product development process, product itera-

tion development mode, application system integration, etc. This ensures the standardization, advancement, reasonableness, practicality and economy of system design schemes.

As shown in the figure, the CNG gas cylinder e-tag safety management network system consists of the foreground and background software systems and front-end hardware components (identification terminals, controllers, transmitters, etc.). It covers such contents as definition of system application roles, system networks and hardware platforms, servers and data storage systems, standard system construction, application system construction, interfaces and interactions with other systems, etc. The application system roles are as follows: the system defines and manages the roles concerning quality inspection system, including workers, leaders, supervisors, enterprises and governmental organizations (manufacturers, refitting factories, complete-vehicle makers, charging stations, etc) and the public, etc.

System networks and hardware platforms

The networks and hardware of the CNG Gas Cylinder E-tag Safety Management System construction is divided into two parts. One is the construction of network and hardware in the quality and technical supervision system of Chongqing Municipality's using of existing resources (using existing networks, hardware and safety platforms for business applications and functional deployments), and the other is the construction of society-oriented application services. This part is finished via Internet. Servers and data storage systems: CNG Gas Cylinder E-tag Safety Management System will have an independent database server and application server connected to the servers of other operation systems. A storage and backup system will be established.

Application system

CNG Gas Cylinder E-tag Safety Management System fundamentally enables information sharing, application coordination and base platform standardization. Its scheme design, content construction and application deployment are performed in three aspects: people integration, information integration and process integration. Standard system design: the problems regarding e-administration system construction in China are in-

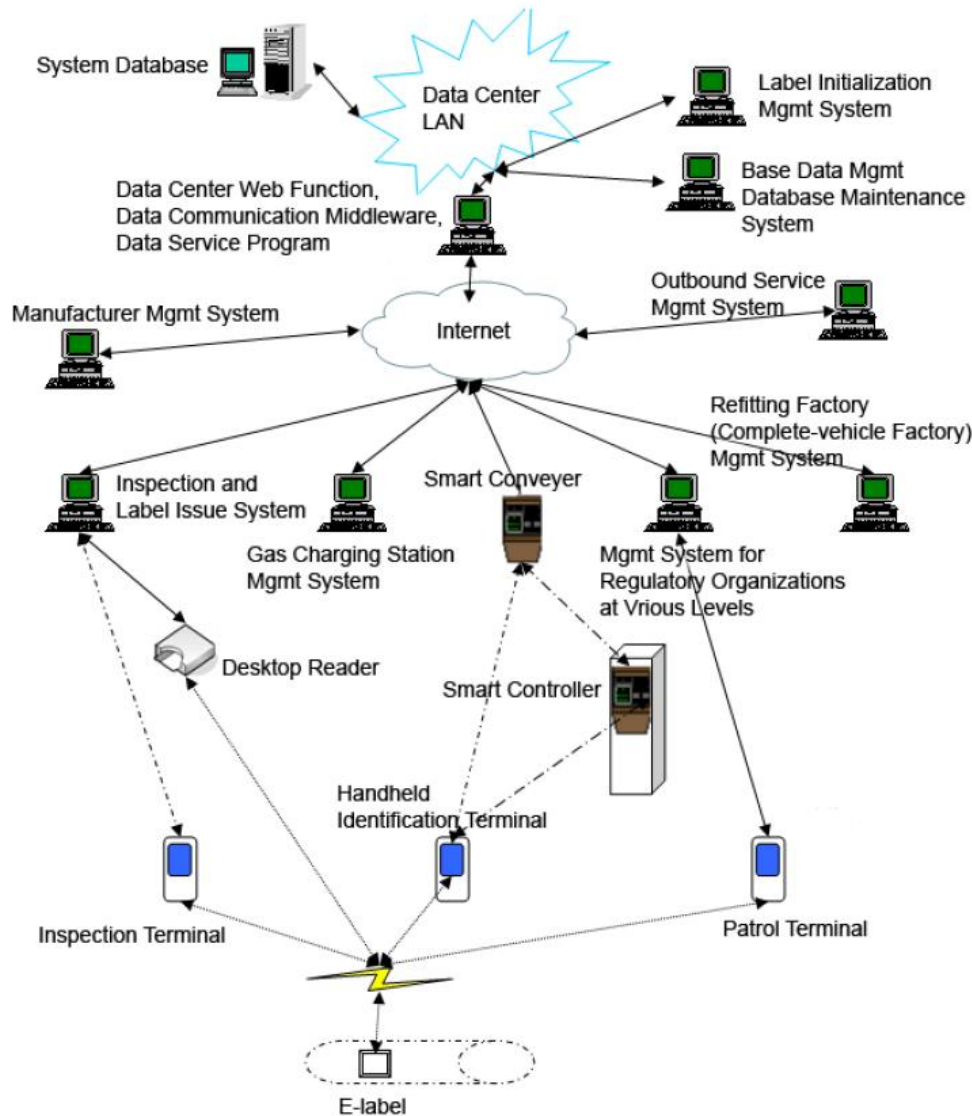


Figure 2 : Overall architecture

consistent data standards, discontinuous business processes and information silos. So, standardization is the important fundamental work in project construction and also the key point and bottle neck that constrains the development of e-administration in China.

INTELLIGENT APPLICATION IN SPORTS EVENTS

Because enterprises require strict RFID verification, energy saving, SIP intercom and so on, TASHI intelligent integrated terminal is featured with easily-using WINCE platform, programmable DI/DO and intercom as SDK (software development kit). This will make enterprises easy to verify identification and let life

be easier.

Intercom-supported SIP Proxy, IP-PBX and etc., application, smart phone, IP video phone and personal PC can be done through audio-visual integrated application with TASHI intelligent integrated terminal series products.

ISMS signals are doubled via a coupling element between the electronic tag and the reader. Coupled channels are formed according to the timing relationship between energy transfer and data exchange. The RF signals' coupling occurs between the reader and tag. There are two types: the inductive coupling and the electromagnetic backscatter coupling. The inductive coupling is through space high-frequency alternating magnetic field coupling and is based on the law of



Figure 3 : Face recognition technology solutions

electromagnetic induction. The inductive coupling is generally suitable for medium and short-range radio frequency identification system for low frequency work, identifying the role of distance which is less than one meter, and Olympics tickets identification system adopt this coupling^[9]. The electromagnetic backscatter coupling in accordance with the radar principle model work, that out of electromagnetic waves emitted, reflected the face of goal, while carrying it back to the target information is based on the space of the electromagnetic wave propagation law, generally suitable for high-frequency electromagnetic backscatter coupling mode microwave work for long-range radio frequency identification system, the identification effective distance greater than one meter^[10].

Readers can send a certain frequency of the RF signal by the transmitting antenna. The induction current is generated when attaching labeled target objects into the working area of the transmitting antenna, and sending out the energy stored in the chip product information from electronic tag obtained by virtue of the induced current, or actively sending a frequency signal. The readers can demodulate and decode the receiving antenna to the carrier signal transmitted by the electronic tag, to the data management system to the processing. The data management system determines the legality of the electronic tag, and makes the appropriate processing and controls different settings according to the logic operation.

STADIUM FACE RECOGNITION SYSTEM CASE

The security system is the focus of the sports construction projects. The focus of the organization and participating audience determine the success of the game. Holding sports venues which receive a lot of audiences, athletes, managers and service personnel, the identity of the participants is extremely complex and the population is constantly moving in, so how to verify the identity of these officers, how to track and check the identity of suspected persons' activities are fully prepared. The security system is a comprehensive application of the results of the field, where the access control system is a key link in the whole security system.

The face recognition technology is the core of face recognition system, and cannot be copied. The face recognition system has a wide range of applications, from the face recognition access control system to the face recognition access control attendance system. Face recognition system combines computer image processing technology with biostatistics principle. First, collect and input face database, acquire facial feature analysis and the establishment of the mathematical model, using the principles of biostatistics, namely facial feature templates, and then calculate the facial feature templates stored in the database, face characteristics of the site using the built templates and terminal acquisition device

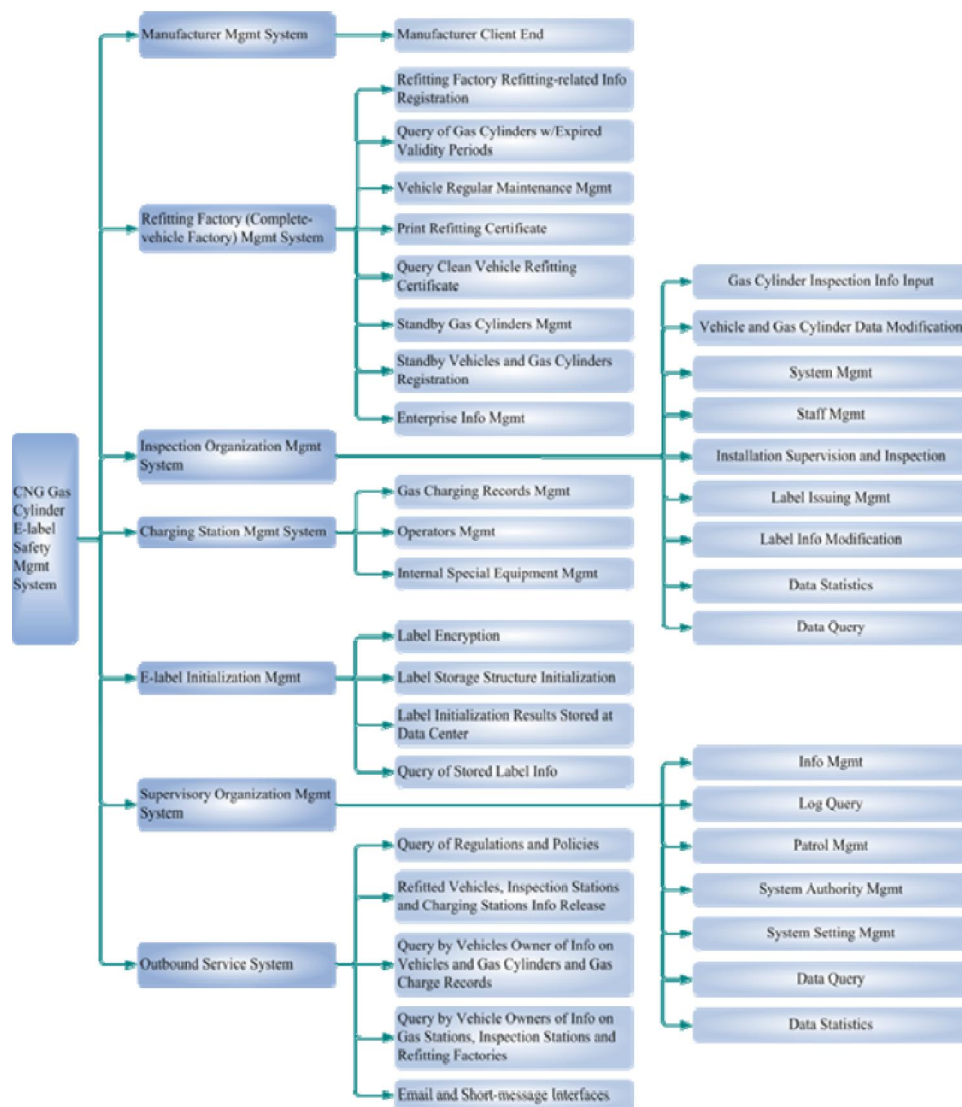


Figure 4 : Stadium in face recognition system works

input is detected by the face characteristics were analyzed, and then based on the results of the analysis to give a Similar value, this value can be determined whether it is the same person, so as to achieve the purpose of identification^[10].

- (1) The face of acquisition and tracking functions: capture is detected in an image or a video stream portrait is separated from the background of the portrait and face, and automatically to save it. Tracking portraits capture technology to track automatically when the specified Portrait move within camera shot.
- (2) Face recognition match: two kinds of face recognition points to verify the type and search type matching mode. Verify the formula refers to the registered one capture portrait or portrait database to

determine if it is the same person object for comparison to verify. Search-comparison, all the portraits from the database of registered search to find whether there is the presence of a specified Portrait.

- (3) Modeling and retrieval of the face: You can be registered the data warehousing portrait modeling to extract facial feature and Health adult face template saved to the database. During a face search (search type), specify portrait modeling, and then compared with the database of all of template identification, will eventually be based on the comparison of similar value listed similar personnel lists.
- (4) Real identification function: The system can identify people come in front of the camera is a real person or a photo. Thereby eliminate users Photos fraud.

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This technology requires the user to make facial expressions with actions^[11].

(5) Image quality testing: the image quality is good or bad a direct impact to the effect of the recognition, the image quality of the detection function to be than on the photo image quality assessment, and give appropriate advice to assist in identification.

Increasing intensity of competitive sports games are becoming an important object of the mass media attention and the fairness of the game gains much attention. Competitive sports use the modern technology, which functions play referee role. Currently, automatic face recognition system has been applied in various sports venues and related activities in the region face recognition system has strong throughput of the storage function dynamically capture ability, portability, degree of automation is relatively high, reduce misidentification rate and false rejection rate technology is more mature, and the use of the human skeleton recognition technology, so even turning the modification, it is difficult to Mongolia through its eyes. Compared with the previous fingerprint recognition system, face recognition system has a lot of improvements. The life of the fingerprint technology is not as good as face recognition system; the use of cost is also higher than the face recognition system.

CNG Gas Cylinder E-tag Safety Management System is functionally divided into background comprehensive application subsystem and foreground client subsystem. The background application subsystem, developed using the B/S mode and JAVA technology, is mainly used for data transmission summarization, collation and analysis, data maintenance, routine patrol, supervision and management, etc. The foreground client subsystem, developed using the C/S mode and PowerBuilder technology, is mainly used for internal management and data collection of the user organization.

CONCLUSION

With increasingly frequent sports competitions in cities and the growing number of sports events and participants, safety assurance becomes a problem of vital importance. Therefore, application of relevant Electronic Commerce Intelligent Safety Management System, high-tech products and the whole-process moni-

toring system that can ensure safety to various activities of large-scale sports events are essential and ensuring the security and stability of operating system in the process of system software operation is a top priority. Electronic Commerce Intelligent Safety Management System is stable, which can guarantee security and confidentiality of data in transmission. Since input and output of information data of every aspect of sports events are involved, the security of its operation process ensures smooth progress of the sports events. In the process of operation of the large-scale sports event, analysis of their successful examples, summing up and exploration of the regularity and security of their operation mode and processing of all kinds of information are convenient, effective, safe and reliable. In operation, all relevant departments in charge of the sports events should uphold the principle of keeping pace with the times, respect market discipline and rules of sports events and apply all kinds of information technologies, high-tech products to sports events, so as to ensure the security and optimization of operation procedures of the sports events as well as maximization of operation benefits.

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