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Исследование «облачной» автоматизированной парковки как разновидности электронных административных услуг

С развитием глобальной компьютерной сети и мобильного Интернета ощутимое присутствие в информационном пространстве платформы «облачных» вычислений имеет *автоматизированная парковка*. В данной статье анализируется современное развитие «умной парковки» как нового витка информационных технологий и «умного кампуса» в облаке, который интегрируется в структуру системы управления информацией на базе архитектуры технического обеспечения такого управления. Результаты исследования отвечают современным потребностям *автоматизированной парковки* и могут служить ссылкой для подобного метода проектирования парковки.

Ключевые слова и словосочетания: платформа «облачных» услуг, электронные административные услуги, автоматизированная парковка.

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Research on Cloud Service Platform of the Smart Park from the Perspective of the Smart City

With the development of global networking, mobile Internet, the rapid development and further application of cloud computing as a new round of information technology, smart park construction has become the trend of development. This paper analyzes the current development of the intelligent parking system, the design of networking and cloud computing smart campus integrated into management system architecture based on the application of the technical architecture. The findings of the research can meet the actual needs of Intelligent Park, which can provide a reference for similar construction of the park.

Keywords: cloud service Platform, smart city, smart park.

1. Introduction

In the era of global information and construction of the smart city there takes place the development pattern of the smart park. With cloud computing, networking and other new information technologies, with the perception of municipal administration, smart park is viewed as a new form of the city comprehensive support and sustainable development.

By the end of 2015, the total construction of the 48 national high-tech development Zone and state-level economic and technological development Zone are to promote the smart park. The typical Zhong Guancun science and Technology Park, Cao Hejing Development Zone of Shanghai, Xi'an high-tech Zone, Qingdao high-tech Zone and Suzhou Industrial Park. The development of the smart park in China faces the following three issues. *The first one* arises at the primary stage of its development, with regard to the architecture of information infrastructure to provide good support for the construction of the park. But the park infrastructure architecture, management and service systems are still decentralized, without the intensive synergistic effect. The integration of information technology and industrialization are still vacant. *The second issue* with regard to the smart park development concerns the level of regional imbalance, between the eastern

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and central regions. There is a certain gap between the development levels of the western and northeastern smart parks, economically developed areas and strongly comprehensive technology park. The latter has begun relying on networking, cloud computing and information technology platform of the intelligent parking system construction. The backward park is still at the primary stage of information technologies. There is a common problem pertaining to the actual construction, i.e the lack of unified planning, management system architecture, the information island construction.

2. The development of Daqing smart park

In 2013, Daqing city set up "intelligent Daqing top-level design", the construction of smart government, smart park, 6 rural intelligent application systems. The construction of the intelligent park made a clear plan in 2014: the key construction with the comprehensive management system and service platform. Create in 2016, a public service cloud platform appears to be the construction of the industrial chain of an integrated service system.

With the construction of Daqing high-tech Zone intelligent park, to improve the management and service architecture of the park (the latter being an important driving force for economic development and service transformation), there appear common problems and dilemma. *On the one hand*, parks and enterprises in their rapid development and growth face financing difficulties, rising costs, collaboration difficulty, information asymmetry, and other challenges. They are aimed to enhance the management information system, operation efficiency and innovation ability. *On the other hand*, the technological construction of parks and enterprises turns out to serve as the basic application stage and other basic applications, whereas the businesses continue to expand, external coordination increase. With a single simple application, it has been difficult to meet the demands and be more practical. The high cost of independent information architecture and the long cycle status have become a major obstacle to parks and enterprises adjusting to rapidly changing market demands.

With the widely spread cloud computing, mobile social network technologies and physical networking, the traditional IT application models began changing. To build the intelligent cloud service platform a new software business model SaaS was applied. It is based on the oriented industrial park with a broad market perspective. The intelligent park construction needs the advanced concept of height and technology, herewith emphasizing the practicability of the construction competitiveness with the IT service support. This paper elaborates the technical architecture, construction content and customer value of the intelligent cloud service platform for industrial parks.

3. Overall solution

3.1. The park service architecture

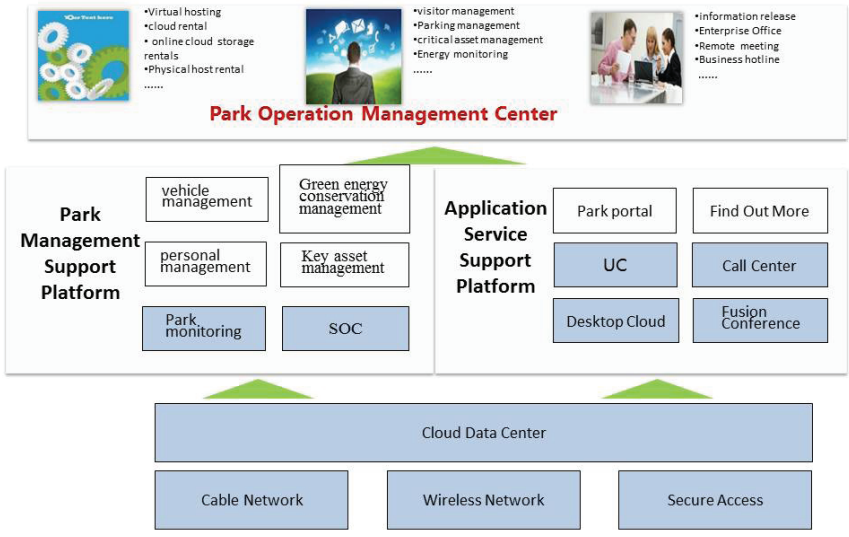
Service oriented architecture (SOA) refers to the network environment according to the demand of loosely coupled coarse-grained application components for distributed deployment, composition and use, so as to effectively control the artificial dependence between the system and software agents.

SOA is viewed as a coarse-grained, loosely coupled service architecture in terms of interface communication. It does not involve the underlying programming interface and communication model. SOA can be regarded as B/S model, XML (a subset of Standard Generalized Markup Language) after Web Service technology for the natural extension. The development of various components, SOA will be able to help software engineers in a new level of understanding of enterprise architecture in the form of deployment. It will help enterprise system turn to more quick, more reliable and more reusable architecture of the whole system. Report to the past, dramatic changes in the SOA system can more calmly face the business use. SOA theoretical model has been applied to the park information architecture. The application of coarse-grained component mapping to the park provides services, application software being mapped to the cloud service platform for industrial park.

The information service in the industrial park for different service objects with the loose coupling mode of component application to build the entire park. So the construction of the application system according to the needs of the business change is more flexible to adapt to the changing environment, policy, service level, business partners, changes and so on, in order to achieve the flexibility to adapt to changes in the environment of business needs.

3.2. Overall design of the park

In order to enhance the enterprise operation efficiency, reduce the cost of management zone, improve emergency handling capability, the protection of physical and information assets and to support the effective operation of the smart park, there has been elaborated overall design of the three platforms (park management support platform, application service support platform, infrastructure supporting platform), and a center (park operation management center).

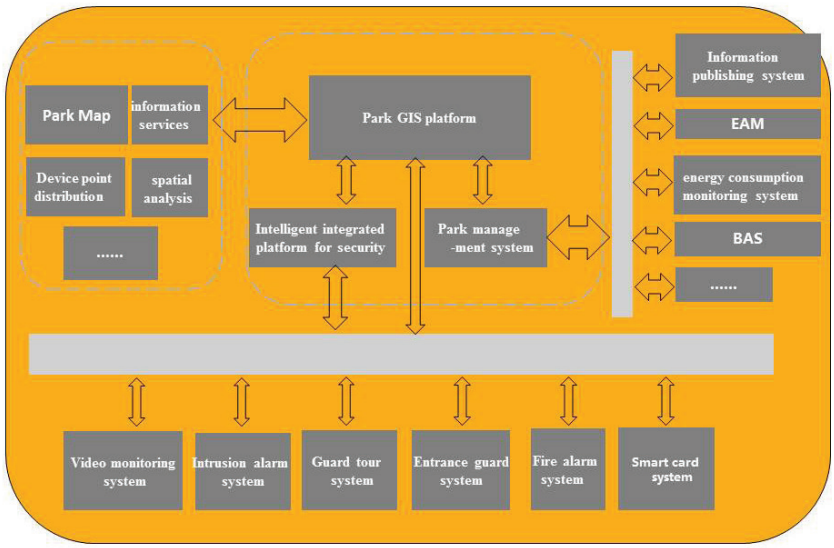


Pic. 1. Overall design of the park

The supporting platform of park management

The supporting platform of park management consists of park monitoring, operation management, personnel management, vehicle management, green energy-saving key

management, asset management and other aspects. The integrated management support platform of various business systems, with an effectively integrated interface, allows an intended user for an access to the portal, park managers and employees providing an intuitive, simple, convenient management of the operation.



Pic. 2. Park management platform

The supporting platform of park management is an oriented park construction and management unit providing comprehensive information services business unit, the creation period of land planning, project construction from the park, investment and leasing, comprehensive property management, the e-government, internal office, business analysis. The park is closely related to an intelligent perception of its management, operation and maintenance with advanced networking technologies aapplied.

The support platform of application service

The supporting platform of application cloud service, unified communications, call center, fusion conference, "card", information station are aimed to build a pool of shared resources, unified management, reliable and scalable. Providing corporate office packages and desktop cloud needs to build the enterprise private cloud. A unified communication is an industry, including voice calls, enterprise mail list, and phone linkage, video conferencing and other functions. The call centers being with the flexible networking, open system support, independent management, telecom level quality. Fusion conference provides the high-quality user's experience, integrated network architecture, efficient operation and maintenance services. There is "one card" to achieve park information, instead of ID cards, wallet, keys, convenient for life. The card improves the efficiency of information station. Allowing for rich, convenient information service, park managers provide business opportunities on the information release platform

The support platform of infrastructure

Through wireless local area network (WLAN) the cloud data center completes the construction of infrastructure. The cable network through a series of switches, routers,

sets up a wireless campus network. The users achieve full coverage, coverage and rapid implementation of the unified network management network that reduces TCO users. WLAN equipment realizes the wireless coverage of the park, and provides a full range of security products, terminal management, file system, database audit to meet customer demands. A unified platform for building the cloud data center provides resources, unified scheduling for users, according to their needs, thus saving the customer investment in the hardware, finishing resources, improving the utilization rate.

Management center of the park operation

In the cloud computing service model the park management application, provided by the platform, promotes the park service concept, service mode, service efficiency to change and improvement. The park can be integrated with GIS system, providing the park leasing visual management. Through the construction of the park investment and rental service platform one can help the park quickly and timely grasp the dynamics of the current park resources on the basis of status, specification for investment, rental management process. To strengthen the mastery of the leasing customers, one should provide better leasing services for enterprises. Situation based on the data for statistical analysis provides the data support for management decision. Park comprehensive management information services include engineering equipment management, real estate security management, property management, warehouse management, five application property contracts and settlement management. The whole process of the management reflects engineering equipment repair property safety, green environment, security service, cleaning management, entry permit, property contract, property management, business property fee, settlement of the comprehensive park.

4. Conclusions

Daqing, as the National Ministry of Science and Technology runs, is said to be the first smart city comprehensive pilot. The construction of the smart park will become a smart city construction in the framework of an effective research and experimental field. At present, the city of Daqing is known to have build 9 industrial parks, including 3 state-level ones, covering agriculture, economy, high-tech technology. The city of Daqing encompasses a total area of 779 square kilometers, having invested 15 billion 100 million yuan in infrastructure, 4268 enterprises settled in employment of 145 thousand people. The park has not only developed the local industry in Daqing City, with an important platform applied to enhancing economic strength, but it also contributed to the development of Harbin Daqing Qiqihar regional economy, with an effective carrier of the city economic transformation.

The cloud services platform of the smart park, with its security, management, construction and other modern services provided, turns out to be the forerunner of the smart park construction. The application of the SaaS platform (according to the different properties of the park, the mature third party integration into the market), especially to small and medium-sized enterprises in different industries group, still needs further subdivision and improvement. Those might be required for different clusters to provide target cloud application services, the application of the platform and real utility of deepening.

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