Operation and Maintenance of Diversified Electricity Production Mobile Terminal Technology

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Keywords: power production, operation and maintenance management, Internet of things, mobile terminals, diversification

Abstract. Electricity production site operation and maintenance work and need to collect operation data, records information about a job, the widespread use of manual recording mode, even if the use of handheld terminal and the function is single. Based on electricity production site information collection method, and hand-held terminal application discussion, formed out of the production and operation and maintenance management needs, the networking technology and mobile Internet technology, combining with the electricity production business, into the diversification of information entry, scanning, photographs, RFID, GPS, wireless temperature measurement technology, making mobile terminal with electricity production professional, suitable for use in power production and field work, complete record of the site and the equipment, security field operation accuracy and safety. Solve the electric power production site portable mobile application, and enhance the power production terminal support.

Introduction

In the existing power substation production site construction, operation, repair process, the need based on all kinds of drawings, equipment operating instructions, product test reports, job ticket, ticket operations and other information help workers complete the relevant work-site construction and the operation of the equipment . These materials are mostly written on paper, limited format information, hardly to be carried, not been able to be viewed in time. Some of the electronic version of the drawings, instructions, operation manual couldn't be viewed at the scene because of the lack of tools what significantly affect the efficiency of field work for the site construction and equipment operation to bring some security risks. After the on-site construction, operations, maintenance work have been completed, the site records personnel, equipment operation information was mainly written by handwritten notes, means of a single, low efficiency what can not be detailed documented job site conditions. It may have some impact on the accuracy of the information field. After the completion of the project, the end of the operation, and the repair is completed, information always need to be re-examined and data files need to be collected what cause a big waste of human and material resource. Electricity production of professional has already used hand-held terminals, PDA and other devices, but the results are unsatisfactory, mainly because these devices are generic products, not for power production site in the achievement of design, features a single, simple message can only be done records and other acquisition function, can not provide more applications [1].

The Condition of Electricity Production Terminal Application

The mobile terminal device universally is used in communications, transportation, medical, logistics and other industries, in order to complete mobile communications, the scene processing, mobile medical, logistics transfer and other applications, to achieve application to extend the existing business. In the electricity sector, the mobile terminal mainly is used for collecting and

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collects marketing data. Currently, on the market, there is no specific electricity production of mobile terminal equipment for professional use. Electricity production business information is still processed by PC side. Whether in electricity production and distribution, substation, transmission and other professionals, we are missing in the field of business process mobile devices on the spot. With the needs of power production safety management requirements and field service applications, number demand for mobile terminals is still very great.

From around the beginning of 2000,SCM handheld terminal (meter reading) are used in the power of ordinary marketing meter reading application, in order to complete on-site meter reading count operation. Because the recording contents are only the energy represents number which is very simple. So the performance requirements of the terminal is relatively low, the embedded microcontroller design, ordinary black and white LED display, memory 256M. Processing capacity is very low, only a simple arithmetic calculation, record customer information, and represents a number. And represents the number of customer inquiries. Interfaces with infrared interface, you can read the electronic table information [2].

Personal Digital Assistant (PDA), also as known as Pocket PC. They are mainly used for commercial, transportation and other industries, in power applications of information and the main stage area of information collection and distribution lines. Compared to the meter reader handheld terminals, PDA has been greatly improved in the aspects of processing power, storage space and wireless communications, it is an important factor PDA applications. With the increase of the wireless communication function, you can achieve data transmission outdoor environment. Display also uses color display. Processing power and storage space have been increased. But limited by technology, PDA screen size, resolution and processing power is limited as well. But the input mode or keyboard input, buttons relatively more [3].

Smart handheld terminals. Along with the development of wireless communications technology and smart phone technology and the rise of smart phones, are getting closer to smart phone performance. Screen size, processing speed, storage space and other properties get greatly improved. Dual-core CPU can reach more than 1G, 8G storage spaces above, and SD card can be extended. It can meet the demand of the processing capacity and storage. Not only can able to complete the recording and storage of information, but also can complete the image capture, video capture better. But in the acquisition mode, there is only one acquisition method by camera acquisition mode which can not fully meet all the needs of electricity production site [4-5].

The contrast can be seen by the above, the production of electric power substation and field applications handheld terminal technology, at the stage of simple entry and the information stored in diverse acquisition mode, mobile performance, processing speed and other aspects of a large gap still exists. Here is a handheld terminal performance parameters comparison.

Power Production Management Requirements

Electricity substation production and field work which the main word is putting into operation, maintenance, and operation and maintenance work substation involving substations, high-voltage equipment and job security is very important for the production of electric power companies. Production operations should make sure the safety of personnel whiles sure the equipment safety. Therefore, besides to help workers to complete on-site operation information recorded, the handheld terminal technology, but also on personnel, operations and safety equipment. It is necessary to complete the deal with production operations while to strengthen the personnel and equipment safety monitoring. Mobile terminal application and promotion of electricity production must be closely integrated with electricity production to meet the demand for electricity production and management of field applications, so the mobile terminal needs to have the following functions:

Information inquiry. Substations and equipment information is the main production site two types of information queries, the mobile terminal to provide accurate information to ensure the safety and stability of substations and equipment. Queries involving substation drawings, equipment drawings, equipment information and operating rules, so the mobile terminal should have a large screen display to ensure maximize content, while providing the accuracy and richness of

information is an important indicator of demand for information inquiries.

Data collection. Electricity production record job information site, not only in addition to fill in text, tables records, but also need to record the operation, the device information, site conditions and other richer data types. The text does not reflect the whole contents. So it is demand to have the function of recording device data, live images, video and other diverse data. Acquisition device status data provide information on the job site image.

Safety supervision. Lack of electricity production site is real-time security monitoring tools, as electric power production site by the worker carrying a mobile terminal device that can secure the protection of personnel and equipment. It can identify the person and equipments by handhold terminals. It is able to accurately identify the information personnel and equipment to ensure accurate operator. Demand for end-use applications of electricity production analysis are shown in Table 1.

Table 1 Demand for end-use applications of electricity production analysis

Functional requirements	contents	requirements
Information inquiry	Drawings, data, procedures	Diverse, abundance
Information enter	Text, numbers	Simple, fast
Data collection	Device data, images, pictures	Accurate, clear
Safety supervision	Personnel identification, equipment identification	Real-time, accurate

Diversified Acquisition Technology

Through on-site power production by the demand for mobile terminals, it can be seen closer to the mobile terminal needs electricity production applications, complete the information inquiry, data storage, device identification, personal identification, data transmission, image acquisition, wireless communications and other applications. The power production site demand combined with networking technology, the development of mobile Internet technology, integration of the mobile terminal diversified technology, will be more demand for electric power production; auxiliary power production is completed on-site processing of information. Mobile terminal applications for electricity production and operation and maintenance operate to provide more comprehensive support and protection.

Electric production of special mobile terminal fusion is diversified technology support multi-dimensional information collection, printing, scanning, and storage. The mainstream information collection methods integrated into the terminal device. With bar code scanning, RFID recognition, image capture, video capture, GPS positioning, wireless communications, handwriting / touch operations and other functions, to achieve electricity production site of various types of information gathering accurate data. Performance parameters power born diversified terminal are shown in Table 2.

Table 2 Performance parameters power born diversified terminal

CPU	Dual-core 1.5Ghz above
RAM	2GB
storage	16G, 128G scalable
Show	5-inch color capacitive screen
System	Android 4.0
Input	Touch operation input
Interface	USB
Communication	3G/4G
Reading mode	One-dimensional, two-dimensional bar
	High-definition camera, camera
	Fingerprint recognition
	Infrared Temperature Measurement

Diversified Mobile Terminal Development

Based on diversified mobile terminal application network technology, use of the internet of things technology, and the integration of a diversified manner are increasing identification function personnel, equipment, production site camera, camera, fingerprint recognition, GPS positioning capabilities to meet the electricity production of various types of site conditions of professional applications. The perception of things, wireless communication technology into mobile devices, will be advanced electricity production dedicated mobile terminals, as mobile terminal specialized electricity production with strong prospects.

With the development of the mobile Internet and intelligent terminals, future mobile terminals will replace the PC terminal. Mobile terminal applications will do more business electricity production processing to achieve real-time application site. As an important pillar industry, electricity production transportation maintenance work will also comprehensive application of mobile terminals at the same time to protect the site personnel, safety equipment, complete and accurate record of production information.

Summary

Electricity production diversified mobile terminal technology to meet the electricity production of professional and field application of the premise, the now mainstream information collection mode, integrated into the terminal device. It supports multidimensional information collection, processing, storage. Suitable for power production professional applications to meet a variety of occasions, location, environmental work requirements, easy to carry, simple operation, information-rich, large memory capacity. By field applications in electric power production, display rich production operations and electronic data sheet, reduce operating information input, and improve the efficiency of field work. Electricity production site is to ensure efficiency and accuracy of information, support and protection for the power production field applications.

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