Shopping card reader appearance design and analysis

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Abstract

The main problem to be solved in this paper is how to effectively improve the speed of supermarket cashier. In the process of payment, customers often have to wait in a long queue, which is obviously not in line with the fast-paced life of modern society. Through the self-service shopping mode, customers can take the initiative in the POS process and scan the barcode information and complete the payment by themselves. Since the appearance of paper money, people used to take paper money to shopping, wallets and wallets became the new carrying tools. But after a few changes of hands, the paper money became less and less sanitary, which was easy to spread diseases. Moreover, taking the paper money to shopping would take too much time when waiting in line for payment. So, with the help of technology, people learned to use debit CARDS and credit CARDS based on mutual trust between countries and individuals. People can buy and exchange with invisible money. In recent years, the emergence of mobile phone payment as the representative of the electronic wallet, people have no difference in the replacement of labor from tangible to intangible, from the physical to virtual, from the atom to the electronic, this is the progress of human technology and ideas.

Keywords

Card reader; Appearance design; Analysis of the.

1. The background

POS (Point of sales), which means "Point of sale" in Chinese, is a point-of-sale information management system with cash or barter payment functions. Its main task is to provide data services and management functions for commodity and media transactions and conduct non-cash settlement. The POS machine reads the cardholder's information on the bank card through the card reader, and then the POS operator enters the transaction amount. The cardholder enters personal identification information (namely password), which is uploaded to the card issuing bank system through the unionpay center. The online transaction is completed, the success information is given, and the corresponding notes are printed. The application of POS realizes the online consumption of credit CARDS, debit CARDS and other bank CARDS, ensures the safety, speed and accuracy of transactions, avoids the manual inquiry of blacklist and pressure sheet, and improves the work efficiency. With the popularization of science and technology, POS machines are widely used in all aspects of people's life, among which the supermarket shopping card reader is most closely related to our life. Undoubtedly, the application of shopping card reader has brought great changes to the management and sales of large and medium-sized supermarkets, chain stores, hypermarkets, large and medium-sized restaurants and all retail enterprises with high level management, as well as certain degree of convenience to consumers. POS machine was born in 1996, the current POS machine has 17 years of development process, in the development of more than ten years, has experienced the bank POS machine, cashier POS machine and other versions, the achievements made by people sigh. In the process of the continuous

development of POS terminals, some device platforms with Windows CE or Linux as the core, such as mobile POS terminals and wireless charging POS terminals, have been born. At present, the practical value of the newly developed POS machine is not great, but it has laid a good foundation for the development of POS machine, and let people see its potential value and influence in the future. POS machines are getting more and more popular with richer functions, better usability and more stable performance. And in many kinds of POS machines, many types of products will have some defects in design or appearance.

How to make the design better serve our life is the goal that the designer pursues constantly. Through long-term observation, it is found that there are still many problems of man-machine incoordination in the use of POS machines. According to Norman's "design psychology", it is not the user's fault but the product design that makes the product difficult to use and unsuitable to use. Similarly, the current problem of POS machines in supermarkets is not the responsibility of cashiers and consumers, but that the POS machines themselves are not simple and easy to use in the design, and the designers do not have a better understanding of the users.

Designers require people - oriented, to create a better life for mankind and design. Shopping is closely related to our daily life. The high-tempo life requires us to improve the efficiency of shopping. With the development of microelectronic technology, POS machine has gradually become an indispensable tool in the commercial field. Through the investigation and analysis of the existing POS machines, the author used the knowledge related to design to improve the design, and finally put forward his own design scheme to solve the problems encountered in the use of POS machines, improve the efficiency, and better meet the use of cashiers and consumers.

1.1 Development history and status quo of POS machines

In terms of the sales volume of POS machines, IBM, hisense and kawada are the POS manufacturers of over 10,000 brands. These three POS manufacturers with the largest sales volume account for nearly a quarter of China's POS market. IBM mainly occupies the high-end market, hisense products are the main force in the middle and high-end market, and kawada products are the famous brands in the middle and low-end market. The sales volume of sandaronkin, partner and WINCOP is not far from 10,000 units, which is also the main force of domestic POS brand machines. Bao profit, yingtai is also a famous brand of POS brand, kun shen and fei MAO is mainly the leader in the touch screen market, kun shen is also the main supplier of China lottery machine. Start from the DIY - POS emerging manufacturers in recent years also obtained the swift and violent development, they besides DIY - POS sales, has also been gradually create their own name-brand computer, but most of them are in the lowest parts of the low price in the POS, the low-grade brand and DIY - POS sales have considerable, if the two forms is combined together, easy to access business group, the battery has the stage of sales, followed by -guanshuo, Ken, ji into, easy saint, Rio tinto, the seven big companies, Their annual sales of POS brand machines and do-it-yourself POS have accounted for about a quarter of China's POS market. Since 2003, the well-known domestic POS machine enterprises led by sitong have promoted a large number of domestic brands of POS machines in China, and enterprises such as chuantian and longbao, which used to be famous for DIY, have also turned to produce brand machines. In 2003, the sales volume of middle and low-end brand machines in China was far higher than that of imported high-end machines and do-it-yourself POS machines, indicating that most enterprises abide by national laws. After all, illegal enterprises are rare. The domestic brand machines are basically equal to the imported ones in function, and the after-sales service is better than the do-it-yourself POS machines. The price is much lower than the imported ones, which is basically close to that of DIY. It is the most appropriate to describe domestic brand POS machine with good quality and reasonable price.

Brand, quality, funding, credit from the enterprise comprehensive strength to compare, IBM, WINCOR, hisense, kawada, sander among, zhongke ying tai, shooting, treasure profit, he shen, fly overseas ten manufacturers is China POS name-brand computer market mainstay, if add a four-way, YouTong, this dozen powerful manufacturer sales total cash registers with a fifty percent share of the

market of China, basic covers the high-grade market. Because these manufacturers' brand, quality, reputation in the market is good, marketing channels, agents are relatively stable, so the annual sales are relatively stable, and there are varying degrees of growth.

The brand of well-known manufacturer, quality, credit standing is better on the market, sale channel, agent is relatively more stable, because this every year the sale volume is relatively more stable, and have the growth of different level. In recent years, some foreign manufacturers have tried to re-open the Chinese POS market, but in general, little success has been achieved. On the one hand, its own advantages are not obvious; On the other hand, it is difficult to find strong dealers, high-end brands are difficult to compete with well-known brands, and in the middle and low end of the market is lost to domestic brands, the autonomy of the local strategy is difficult to adapt to the rapidly changing market. Newly developed in recent years, a batch of POS machine manufacturers, although speed is quite fast, but as the market competition is fierce, swords, price war, is intense, and therefore its development status are different, both in digging until after the first bucket of gold, improve quality, create brands and development manufacturer, there are ups and downs, and not to vendor quality, a flash in the pan. Most emerging firms are struggling in the red sea of price wars and are finding their way to the blue sea. Low-priced products can allow manufacturers to grab a share of the market for a period of time, but manufacturers can never establish a long-term stable relationship with dealers. Admittedly, whether an enterprise can walk on the track of healthy development, quality and reputation play a decisive role.

1.2 Development prospect of POS machines

POS cash register has developed from the first generation of cash register to the second generation of cash register (ECR electronic cash register). The third generation of cash register has an open system, which can be applied to a variety of platforms and application software, can also be connected to a variety of peripherals, can also use IC CARDS, bank card terminals, single or networking, can also be connected to the Internet. With the rapid development of the POS machine industry, the price of various POS machines with high performance has been more easily accepted by the merchants. Coupled with the fierce competition, the role of information system in the competition for these shopping malls has been significantly improved, and the demand for POS machines has also significantly increased. The adoption of POS cash register system greatly reduces the intensity of cash register personnel, improves the efficiency of cash register, and also provides more convenience and convenience for consumers.

In 2014, the POS machine industry has entered a period of stable growth. Seen from the coverage rate of POS terminals, the number of POS terminals per capita in China is far lower than that in foreign countries, and the market space is vast. The number of POS machines per 10,000 people in China is 13.7, jumping to 179 in the us and 625 in South Korea, according to the data. China's per capita coverage of POS machines is less than 1/8 in developed countries.

With 1.3 billion people, China will have at least one bank card per person, one credit card for half of the population and 5 million POS terminals installed by 2015, which will drive the further development of the domestic POS market.

At present, the POS system has become the information age means a major capital flow and monetary payments, the popularity of domestic POS system is adapt to lifestyle and an inevitable trend of the development of the financial system, bank CARDS, the popularity of POS application is fast, as long as you is a place where there are goods in the future will have a POS machine, the 21st century is an era of information technology, as a result of the POS market must be a huge market.

1.2.1 analysis of existing products

Zhongke yingtai is an enterprise mainly engaged in the production of POS machines, whose main products are tax-controlled cash registers, commercial cash registers and RFID series products. The company is located in the beautiful coastal city of Qingdao, product sales network throughout the country. As a member of the working group of the national standard for tax controlled cash registers,

he was the first group to obtain the production qualification for tax controlled cash registers issued by the ministry of industry and information technology and the production license for tax controlled cash registers issued by the general administration of quality supervision, inspection and quarantine.

图3-1 AnyPOS3160s POS机

Figure 1 sundar Pure POS 80

Yingtai's POS machine anyPOS3160s is designed for large supermarkets and shopping malls, which can meet the needs of single machine and networking. It has excellent cost performance and flexible configuration, and can maximize the investment of users. The POS on keyboard design using K884 / M, keyboard keys for the functional partition, and the increased size, part of the function keys on the screen, with 15 inch LCD, LED increased the visibility, but shortage is its key to use colors to distinguish, it takes time to lead to operating personnel training before they can skillfully use POS machine. At the same time, the size of its customer display is too small. From the perspective of customers, the visibility is not good enough.

Shenzhen sunda commercial machinery co., LTD., established in 1987, belongs to China electronic information industry group (CEC), is a large class a enterprise, which was listed in shenzhen stock exchange in 1993, and has been awarded the title of top 100 Chinese electronic enterprises and large state-owned listed electronic enterprises for many years. In 2009, it won the 53rd place in the 22nd electronic information top 100 enterprises. The company has established its advanced management, research and development, production and quality assurance system, independently developed and produced series of sunda POS The annual production capacity of 100,000 sets of POS products and 1 million sets of tax-controlled products has been established. Sunda POS products are exported to north American and European markets 10,000 sets per year.

Table 3-1 sundar Pure POS 80 hardware configuration table

The processor	Intel dual-core 1.8 GHz
memory	DDRIII2GB
The hard disk	More than 500 gb
A serial port	six
Parallel port	1

Keyboard interface	One (ps/2)
The mouse interface	One (ps/2)
Ethernet interface	1
VGA port	1
USB port	6 (2 for the front panel)
The case	Industrial PC box, dustproof, heat dissipation, lockable
Magnetic card reader	1/2/3 rail 500,000 lifetime
Wireless network card	802.11 b/g (optional)
display	12.1 "LCD
Vice monitor	12.4 "TFT
The keyboard	KB63 (mechanical key core) KB64 (film key core)
cashbox	CR3000 full thickness steel, anti - theft, three - gear lock
Bill printer	76mm 9-pin, 18-pin printer or 80mm thermal printer with electric cutter
Customer display	VFD high brightness, full dot matrix, Chinese secondary character library
color	Dark grey
The power range	180 ~ 264 vac 47 ~ 63 hz
The work environment	Working temperature 0-55 c storage temperature -40 -55 c
specifications	(length/width/height)43cm*35cm*45cm

Complete the POS machine, high configuration, interface, keyboard adopt KB63 key mechanical keys (core) and KB64 key key core (film) to choose from, is divided into two functional areas at the same time, simple and clear, the two equally 10.4 inch TFT LCD screen display, make the customer and the cashier in the equal status of commodity information, embodies the fair, transparent, shows respect for the customers from the heart. The disadvantage is that the display size is too small, visibility is not good.

1.3 Industry analysis of POS machines

With the continuous improvement of domestic consumption level and the enhancement of consumption consciousness, new POS machines are constantly emerging in the market. China's financial POS machine industry development status and investment prospects forecast analysis report incomplete statistics, China's POS machine industry with an average annual growth rate of 15%. The latest system and the most humanized design are the selling points of the new POS machines.

Along with the computer hardware technology, the software development ability and the network security technology further enhancement, the national information superhighway construction, the network bandwidth and the scale expand unceasingly, the network will be everywhere. In the aspect of finance, financial business has shown a high degree of electronic and networking trend, in the composition of financial electronic, electronic payment tools in recent years in our country has been rapid development, especially for the huge target audience - all consumers of financial POS machine is more and more attention by investors from all sides.

By the end of 2009, China had issued 2 billion bank CARDS, up 14.8 percent year-on-year, according to the in-depth market research and investment strategy analysis report of China's POS machine industry. There were 1,566,500 online card and inter-bank payment system merchants and 2,408,300

online POS machines, an increase of 384,800 and 563,200 units respectively from the end of 2008. At the end of 2009, the number of bank CARDS corresponding to each POS in China was 858, a year-on-year decrease of 12.1%. Bank card acceptance market construction has achieved remarkable results, bank card use more convenient, fast. Compared with developed countries, the number of bank CARDS corresponding to each POS machine in China is relatively high, and there is still a huge space for the development of financial POS machines. With the maturity of telephone POS payment in the market of terminal equipment and platform system application mode to cultivate customer acceptance, the market has developed rapidly. At present, telephone POS has been widely used in shopping malls, supermarkets, wholesale markets, small and medium-sized commercial circulation enterprises, and has become one of the mainstream electronic payment channels keeping pace with traditional POS and ATM.

2. Conclusion

Traditional POS terminals to keep growth momentum in recent years, new incremental 925700 11 years networking POS machines, up 61% from a year earlier, but its ownership by the end of 4.8265 million, only 11 is far lower than the ten thousand units, number of the country merchants and traditional POS issue gradually tightening in recent years, mainly for large and medium-sized businesses provide smaller because do not accord with standard is difficult to apply for, in this background and application standards, under the background of this phone POS in China more than 20 million small businesses, small businesses in the market to become the mainstream. At the same time, by the end of November, a total of 101 domestic enterprises had obtained the third-party payment license, and the application gradually extended from the field of e-commerce to the traditional category, and penetrated from the online to the down. It is expected that third-party payment enterprises will increase the layout of outlets, and from the perspective of cost, telephone POS is expected to become the first choice. Industry analysis of POS terminals predicts that the overall growth rate of the telephone POS market will be about 30% in the next few years. Due to the small revenue base and obvious channel advantages, the growth rate of the telephone POS market is expected to exceed the industry average in the next few years.

References

[1]LIVIU NEAMŢU,ADINA CLAUDIA NEAMŢU. LICENCE, DESIGN AND MARKETING EXPERIENCE RELATING TO A PRODUCT OR PROCESS[J]. Analele Universităţii Constantin Brâncuşi din Târgu Jiu : Seria Economie,2013,5(5).

[2]Phillip A. Sanger. Integrating Project Management, Product Design with Industry Sponsored Projects provides Stimulating Senior Capstone Experiences[J]. International Journal of Engineering Pedagogy (iJEP),2011,1(2).

[3]Matjaž Finšgar. 2-Mercaptobenzimidazole as a copper corrosion inhibitor: Part II. Surface analysis using X-ray photoelectron spectroscopy[J]. Corrosion Science,2013,72.

[4]Luis Cândido, Wilson Kindlein,Renan Demori,Larissa Carli,Raquel Mauler,Ricardo Oliveira. The recycling cycle of materials as a design project tool[J]. Journal of Cleaner Production, 2011,19(13).

[5]Fatimazahra Guini,Abdellah El Barkany,Abdelouahhab Jabri,El Hassan Irhirane. An Approach for the Evaluation of a Product's Process Planning during the Design Phase through a Group Multi-Criteria Decision-Making[J]. International Journal of Engineering Research in Africa,2010,921(1).

[6]Antti Ainamo. Coordination mechanisms in cross-functional teams: a product design perspective[J]. Journal of Marketing Management,2007,23(9-10).