The Investigation of The Conveyance on The Existing Bus Stops Information for The Elderly

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Abstract: Riding information of bus was old and complicated, the information of bus routes, stations, car numbers, and schedule. The research aims to the communication information of the existing bus stops' information software from the perspective of the elderly.

Analyzing from interactions or design deficiencies between bus stop and the elderly; then adopted structural questionnaire interviewed the elderly what kind of the information in the object and necessary when they faced on the problem of riding information. In the future, we have deliberated about the obvious and simple bus stops information to improve the quality of the bus transportation system that provide barrier-free transportation environment for the elderly and raising the quality of life.

Key words: Elderly, Bus stops, Information transmission.

1. Introduction

Since the aging society was coming, the proportion of the elderly used public transportation was getting increased. The elderly almost live in the cities and their mainly transportations which carrying on the bus or taking a walk. However, the public transportation system established completely in Taipei city, the riding information of bus was old and complicated, which could confuse the elderly. According to the information of bus routes, stations, car numbers, and schedule which could be delivered correctly is the worthy issue to discuss.

2. Methods

First of all, we investigated the existing bus stop information to collate and analysis for realizing the design of the sign object function that easy to understand and remember, Because it related forms and contents, locations, so the investigation focused on bus stops in order to keep the information object design factors, creating experiment subjects, classifying and analyzing the information contents in the bus stops.

3. Results

3.1 Analysis result of bus stop design

There were many kinds of bus stop types, mostly were "P" type bus stop like a pole in Taipei city. Factors that influenced the information communication of bus stop were their information contents. According to the investigation results, we classified the information contents of bus stop into 5 elements, which were "page size

and l ayout, t ext f ont, t ype size an d viewing di stance, color protocol an d t raffic si gn." Analysis was f or understanding the i nformation c ommunication c haracteristics of eac h ele ment and t he res ults would hel p t he interview of elders' bus stop information needs.

1) Page size and layout

While illu strating th e graph ic d esign work, leav ing prop er b lank sp ace was go od for read ing the information. Figure 5 sho wed th e an alysis resu lts of each in formation co ntent item's area, total taking the whole b us stop 66.3% place. Users thought the illustration of bus stop was too jam-packed and that was why the bus stop needed to redesign each information content item's square measure rate.

2) Text font

The st op name, ot her st op name of a r oute, ro ute i nformation an d cu stomer i nformation were used 4 t ype Chinese characters. Using different text font to present each information content item showed the result of messy bus stop illustration.

3) Type size and viewing distance

The e xperiment res ult sh owed t hat t he height of bus stop was 275.5 cm . Chinese character's strokes we re numerous with com plicated c onfigures a nd for t his rea son, t he i nfluences o n t ype si ze, vi ewing distance a nd vision angle were more serious.

4) Color protocol

The basi c col ors of bus st op were whi te and yellow; r oute numbers were red f or enha ncing the sense of recognition; S top n ame was black wi th y ellow background t o bring o ut t he cl earest c ontrast i mpression. And other stop name in a route was black with white background.

5) Traffic sign

The traffic signs in ex periment bus stop were no n-text symbol and used to mark the route, section and po sition (Figure 1). The existing traffic sign was hard to understand its meaning without Chinese description, more over, the meaning of Chinese description was also hard to get the idea and like the traffic sign of "buffer zone" did not use the symbol well for sending the meaning of Chinese description.
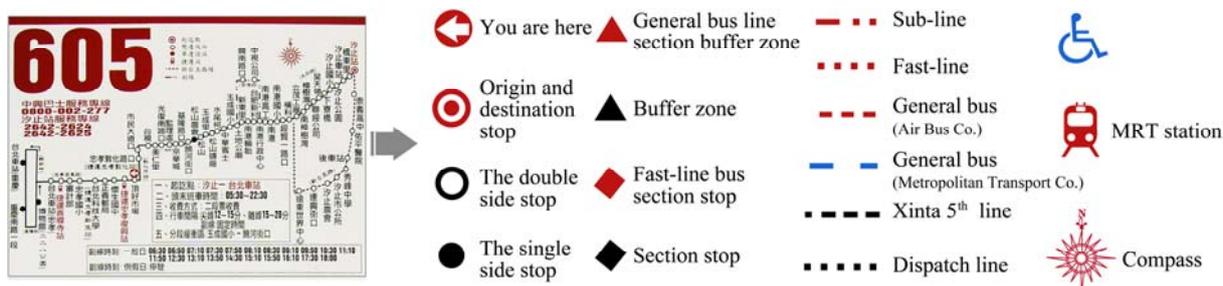

Figure1. The traffic sign of bus stops

3.2 The interview of elders' bus stop information needs

1) Basic information of interview subjects and their experience of taking a bus

Interview location was at "Dinghao Market." It was for understanding the characteristics of elders' transportation behaviors and their needs of bus stop information. We interviewed the elderly there about 10 ~30 minutes. There were total 9 experiment subjects. The average age was 72.5 years old. All of them lived in Taipei city. Interview

started with their experience of taking a bus, especially the experience level of reading bus stop information. All of them took bus and MRT as their mainly transportation. The frequency of taking a bus was everyday.

2) Analysis result of interview

The information in existing bus stop was complicated. According to the analysis result of last stage, the bus stop information was sorted to 8 contents as interview direction in order to know well about the bus stop information necessity of the elderly and communication efficiency (Figure 2). Follows were interview analysis results (Table 1 and Table 2).
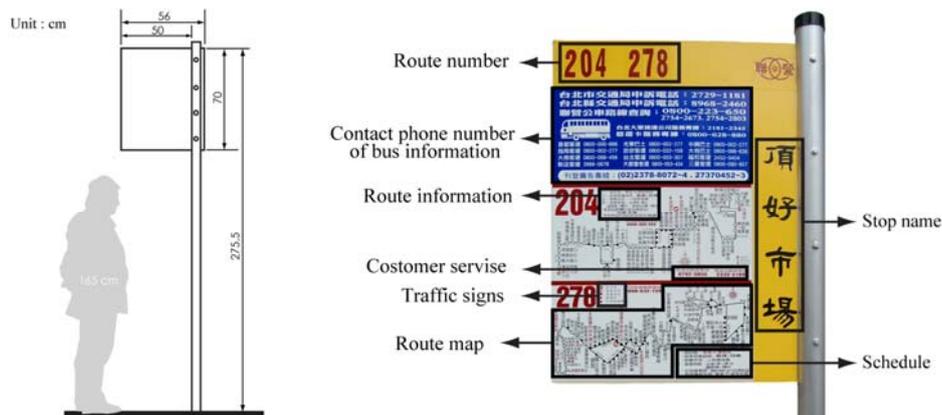

Figure2. Interview direction of bus stop information (8 contents)

Table1. The bus stop information communication efficiency to the elderly

Information content	Communication efficiency		Analysis result
Route name	Clear		Route name was black with yellow background, it was very conspicuous. Most elderly thought route name had good communication efficiency.
	77.7%		
Route number	Clear		Route number was red with yellow background on the topside. Most elderly thought it had good communication efficiency. Only one subject thought it was very unclear.
	88.8%		
Contact phone number of bus information	Clear		There were too many texts in contact phone number of bus information area and type size was too small. The position of this information content was the highest and the existing bus stop was too high, those made the result of hard reading.
	77.7%		
Route information	Clear		Most elderly thought route information was simple and clear. The marks of regular, peak and off-peak time schedule were the most important.
	88.8%		
Route map	Clear	Unclear	It was easy to interrupt elderly reading the route map and became their hindrance when they went to a unfamiliar bus stop. The existing route map was too long and complex. The better ways were simplifying, enlarging the type size and enhancing the color protocol.
	44.4%	44.4%	
Schedule	Clear		6 interview subjects thought schedule was clear and 2 of them very unclear.
	66.6%		
Customer service	Clear		Elderly using the customer service was practically negligible. They thought the type size of customer service was too small and the communication efficiency was bad.
	44.4%		
Traffic sign	Clear	Unclear	Nearly half of interview subjects thought the traffic sign was not good enough, the type size was too small and unclear. They suggested to use different color could enhance the sense of recognition.
	44.4%	44.4%	

Table2. The bus stop information necessity of the elderly

Information content	Necessity		Corresponding result
Route name	Very necessary		Stop name was very necessary for the bus stop and few interview subjects used "road name" for memorizing the location. It showed the stop names in Taipei city were named by road name, MRT station and business park, not unified and it was hard to remember the stop name.
	77.7%		
Route number	Necessary		Route number was also the bus number and it was very necessary for the interview subjects.
	100%		
Contact phone number of bus information	Necessary	Unnecessary	5 interview subjects thought the contact phone number of bus information was hardly noticed. If they needed to complain, there were a complaint box and special phone on the bus.
	33.3%	55.5%	
Route information	Necessary		The necessity of route information for elderly was very high, especially when they needed to take an unfamiliar line bus.
	100%		
Route map	Very necessary		All interview subjects thought route map was very necessary and it showed the high necessity of this information content.
	100%		
Schedule	Very necessary		Not every bus stop had schedule, only a regular and few runs bus would put its schedule information on bus stop. And elderly thought waiting was acceptable with no time pressure.
	66.6%		
Customer service	Very necessary		Most elderly did not use the customer service. 1 interview subject used one time for a lost stuff situation and that showed the necessity of this information content.
	55.5%		
Traffic sign	Very necessary		Most elderly thought traffic sign was necessary, like single side stop, double side stop, you are here and other signs were the most necessary traffic signs for the elderly.
	77.7%		

4. Conclusions

At pilot experiment, we divided bus stop into 5 items which were panel and layout, text font, type size and viewing distance, color protocol and traffic sign. Then did interview of elderly bus stop information needs for understanding the existing bus stop information communication characteristics.

The information in bus stop layout should be categorized and illustrated with important information (stop name, route number, route map, route information and traffic sign) and minor information (contact phone number of bus information, schedule and customer service). According to the bus stop information necessity results of the elderly, we could redesign the bus stop information layout to provide elderly the most properly route information and service. Besides, text fonts should use the same as far as possible, try not too complex. The route map should be simple and clear, try to use different color in complicated line for enhancing the sense of recognition. And adding blank space or auxiliary clue in other stop name of a route could limit the vision point and range while reading, also let elderly read the route map more easily.

However, there was a big room for improving the existing bus stop design. For example, the existing bus stop was too high and its information contents layout and viewing distance were not considered the users' reading angle. Besides, most interview subjects hoped that P type bus stop could add e-bus system and electronic clock. Facing the aging society now, the design for future bus system should consider more about the elderly transportation behavior, physiological and mental characteristics, like vision and joints degeneration. Designers could refine the bus stop information contents layout and add waiting seats, shadow area and other equipments. Providing elderly a more safe and friendly bus system, it would attract more citizens going out by bus.