SMART COMMUNITY FOR AGING SOCIETY: RECIPROCAL ALTRUISM CONNECTS PEOPLE

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ABSTRACT

This paper presents a smart community characterizing seamless sharing transport system, walking-based lane design, cloud service communication, human-based travel assistance, and monetary credit system in Taiwan. Smart community based on cloud service integrating voluntary works and sharing transport system can provide real-time connection between voluntary car-sharing/pooling service providers and receivers for social activities and care institutes; monetary credit system can promote the safe and low-priced procedures for shared transport services; human-based travel assistance can enable seniors to travel safely and efficiently around travel tools. This study facilitates the new role of senior population to amplify economic output for ageing society.

Keywords: Human-based travel assistance, walking-based community, senior mobility, senior social activities engagement, cloud computing service

INTRODUCTION

According to World Health Organization (WHO) (1998), average life expectancy at birth is on an increasing trend. Global life expectancy has increased from 47 year-old in 1950 to 65 in 2009; by 2050, population of those over the age of 60 is expected to reach 2 billion, which comprises 22 percent of global population, mostly reside in low- and middle-income countries (United Nations 2009; WHO 2012). In Japan and Europe, a growing number of retirees had led to workforce shortage, decrease in capital accumulation, and increasing social spending

on health care and pension (OECD 2005). Consequently, major contributions of studies on healthcare service are suggested to be client-oriented, which can create efficient communications between research organizations and other professional entities in order to develop future workforce and related training programs (Pittman and Holve 2009).

The main health burdens in ageing society are from non-communicable diseases, such as visual and hearing impairment, dementia, and osteoarthritis. Therefore, effective healthcare service delivery in age-friendly environments for seniors at community-level is crucial for elderly to gain independence, reinforce social participations, and contribute fully to the society (WHO 2012).

Healthy ageing can improve the life quality of ageing society, which begins by healthy lifestyle in earlier stages of life (WHO 2012). Seniors could be healthier today and in the future than proceeding generations that, with little assistance to their transport safety and mobility, seniors can perform multitasks in autonomy in contribution to national wealth and become healthier psychologically and physically, which can lead to savings of public funds as one of the greatest social contribution (Hakamies-Blomqvist, Henriksson and Heikkinen 1999). However, in the era of globalization, young people tend to leave their hometown to working places, while older generations stay at home living alone or with their spouses. Senior people after retirement, if living in isolation, usually have limited access to normal activities for socialization and relaxation, nor could they gain free access to hospitals, banks, or post offices; hence, they are used to feel loneliness, helpless, and sadness in their older years.

To resolve the problem, seniors should be given a newer role in the society by providing them with the specific supports to assist in their normal life function. Though there developed various types of sensor technologies and remote communication service to improve and monitor the living environment of seniors, the services still have limitations to satisfy all the demand for physical, mental and social well being. Physically, some have minor or major hearing disabilities, some have vision problems, and others have chronicle diseases like diabetes, high blood pressure, and dementia, which might be developed into multiple symptoms. Psychologically, living in isolation poses the problem of loneliness and depression. Some seniors insist on their privacy to avoid such kind of technology services at home, some are reluctant to pay the cost, some consider the automatic service might alienate them from the casual meeting with their children face to face. From this standpoint, this society needs the human-based monitoring and interpersonal services to continuously improve their living quality and access to the basic needs of transportation, social activities, and interpersonal care in time. Since seniors are mistakenly considered to incapable of engaging in social developing activities, household interpersonal care service based on integrated voluntary human resource of young and senior populations, is suggested for the care of older generation and community development.

Taiwan, feeding a population of more than 23 millions on a bare island of 36,193 square kilometers, has been growing into an advanced industrial economy mainly relying on its advanced technology industries which plays a key role in the global economy. However, first problems arises as limited resources and low birth rate continued that Taiwan is heavily relying on caregivers from foreign countries and forecasted to experience negative population growth by 2023 (Council for Economic Planning and Development, 2010). The facts could pose great threats to its economic growth as young generation is expected to

bear higher loads to take care of the elderly and their children. Hiring foreign caregivers without adequate supplementary policies and assistances might arouse more cultural conflicts. Second problem points out to the growing residential wastes due to rapid depletion of electronic appliances such as television monitors and mobile phones were discarded without appropriate recycling and disposal treatments. To solve the problems, this study spawns a technological innovation to integrate the refurbished e-wastes with cloud service system to improve the life quality of ageing societies by breaking the confines of distances, time, and financial status in each family. Taiwanese lifestyle is mainly built up by Chinese culture; consequently, the start point of this study is conforming to the needs of Chinese society.

Three dimensions of needs were observed in Chinese family care: personal care, household management and maintenance, and social contact (Chiu and Yu 2001). In the dimension of household management and maintenance, the concept of leading healthier lifestyle has become a popular trend, most of seniors have turned out to be healthy enough to take care of themselves with many daily chores, aside from a few errands require family supports such as household repairs and shopping (Chiu and Yu 2001). However, in the dimensions of personal care and social contact, care-gaps arise in household setting. Concerning with personal care; there exists a wide range of difficulties which require intensive interpersonal care while younger people might not pay special heed of; examples are bathing, using toilet, nail- trimming, etc. In context of social contact, seniors reported receiving no help by making phone calls while having difficulties using public transportation system and taxies for social activities.

To meet the needs of seniors in time, care services should be designed to provide multiple forms of services which are safe, convenient, easy, and accessible for seniors everywhere which can solve the care-gaps for any households.

HEALTHY TRAVEL FOR SOCIAL ACTIVITIES ENGAGEMENT IN LATER YEARS

Health promotion activities usually involve in the long term improvement of individual condition. Ravaglia et al. (2008) proved that physical activities might be the key to lowering risk of vascular dementia. Simons et al. (2006) discovered that, daily gardening can lower the risk of dementia by 36%, and daily walking can reduce the risk by 38% in men. Woo et al. (2007) explored that, though the overall beneficial outcomes, i.e., bone mineral density, muscle strength and balance, of Tai Chi and resistance exercise on musculoskeletal health are modest; both Tai Chi and resistance exercise are associated with lower bone mineral loss at total hip in women. Though there is no definite answer to what activities can benefit people in their health during old days the most, it can be concluded that each individual should find the activities which are suitable for the needs of mental and physical health of each individual.

To boost mobility of seniors, health promotion and educational events on healthy travel habits should be convened to promote cycling and walking as the first step to improve health conditions prior participating in any health-boosting exercises and practices. The environment should not deprive travelers of their inborn walking habits. Losing the ability to

walk, due to limited walkable space, is far more serious than to drive. Walking is the most basic ability which keep individual healthy. The act of walk symbolizes the easy connections among homes, transportation system, and destinations of different activities, with or without driving a car. People who only sit and drive will gradually lose their ability to walk for relaxation or activities like exercise or social work. If seniors kept on the innate ability of walking, to perform social and recreational activities for physical and mental health, the productivity of the society will increase. Walking –based communities are considered as the futuristic planning for an aging population, which can create more green space for lowering the environment pollutants and walking facilities from unwanted roads and parking areas

Though traveling by private vehicle is considered as the top priority for senior age, which apparently does not in compliance with government policy of promoting public transport mode. Schwanen, Dijst and Dieleman (2001) discovered that, for maintaining high life quality level, seniors prefer the convenience and mobility of private vehicle, which means to bring about traffic congestions and pollutions. Giving up driving can be considered as entirely negative by drivers, once the personal security in public is a problem. Barriers like carriage of heavy loads, late arrival of public transport vehicle, unclean travel environment, and a lack of toilet, also hinder people from adopting public transportation system. European interviewers expressed the concerns over that transport operators generally neglect the need of senior travelers, while public transport operators usually blame on seniors for causing overcrowding in vehicles (Gilhooly et al. 2002).

Therefore, the safety concerns are the topmost important issues to be solved towards a walking and cycling based community for a healthy life. Walkability could be the most essential component of the transportation environment quality indicator for the livability of the space. It is recommended to build walking-based communities for the near future.

TRANSPORT ENVIRONMENT FOR AN AGEING SOCIETY: SAFETY AND MOBILITY

Danger-free space refers to the intrinsic development of senior society. When aging, seniors gradually lose their sensibility and reaction capacity thus the speed is becoming uncontrollable for seniors to drive. When seniors gradually become dependent on handling motorized transport mode, transportation environment will be risky for people in the system. Automobile-based communities are recognized as compassing wide roads, high traffic speeds and large parking facilities, which create barriers and danger to walking and green space creation.

This study defines that danger prevention indicates timely actions to avoid the external dangers which is destined to occur. This goal could be achieved by timely raising the security level of environment, such as roads cleaning and repairs, railroad crossings warning alerts improvement, maintenance and improvement of traffic signals, setting or revising traffic rules, encouraging the act of periodical health check for timely treatment, etc.

Therefore, it is recommended that elderly will adopt the public transportation mode, for that elderly can walk and cycle as the healthy lifestyle and avoid the higher risk of riding and driving in vehicle at relatively higher speed. With regards to safety and mobility of ageing society, seniors are recommended to enhance danger prevention by engaging in social work

and sharing experiences and knowledge on traveling with safe and fuel-efficient public transport mode; while the overall transport environment should be improved for senior and non-senior populations.

The possibility of traffic clashes still would happen during the events of walking, climbing stairs, traveling through escalator, standing or walking in a bus, hiring taxi in a road, cycling on roads. To encourage elderly to travel freely and safely, the overall environment has to be improved. To increase the security level of public transport mode, this paper suggest lower the speed limit in high population area and broaden the pedestrian walking space, especially around the public transport mode oriented area, to encourage people to travel by public transport mode; this can also lower the insecurity of traveling, by decreasing the pedestrians' time on dangerous road crossings. For the safety of elderly, it is recommended that elderly will adopt the public transportation mode, for that elderly can walk and cycle as the healthy lifestyle and avoid the higher risk of riding and driving in vehicle at relatively higher speed. Public transport mode promotion requires a careful road design for safety of senior travelers.

Based on the study at auto-centric areas in parts of Europe, US, and Australia by Schramm and Rakotonirainy (2009), decreasing road lane width to a functional setting in urban areas can create a safe road environment for pedestrians, cyclists, and vehicles. In urban areas where traffic is busy, it is recommended that motor vehicles and bicycles should travel in separate lanes for different speeds. In ageing society, seniors are generally less confident in managing to cross roads. By creating bike lanes and pedestrian zones, the distance for passing zebra crossings could be shorter, which could lower the risk of car accidents occurred to the ageing pedestrians.

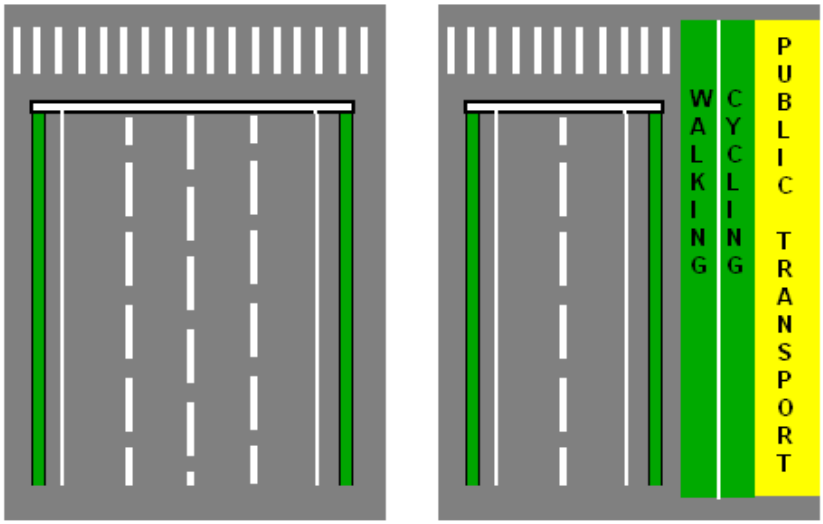

Figure 1 – Roads for motor-vehicle and multiple transport modes

The short zebra crossings also save the time of car drivers on waiting for red signals turn green, thus result in less fuel exhaustion lose in patience, as it is well-known that people are easily lose their patience in older ages. This example also indicates that segregated lane management for different types of vehicle fleets can raise the travel efficiency throughout urban arterials, and thus reduce congestion and avoid the risks of takeovers and pileups owning to speed differences by vehicle types.

RECIPROCAL ALTRUISM IN COMMUNITY

Banister and Bowling (2004) pointed out that the decision-making of activities engagement are affected by factors like chronic illness of individuals, local external environment, feeling of supportiveness and friendliness, the sense of security. Therefore, the dimensions of activeness and passiveness on the decision of travel and locality & social networks are to be considered for the living quality improvement of senior dwellers. However, seniors were found to be unwilling to ask close relatives or friends, for interpersonal care or assistance (Chiu and Yu 2001), unless some kind of reciprocal relationship was involved.

According to Chiu and Yu (2001), seniors are more likely to be respected for their economic contribution in prosperous Chinese families. In poorer families, Confucian practices are less likely to be followed. Elderly care in traditional Chinese society is characterized by the shared care approach provided by extended family units living under the same roof. According to Confucian norms, seniors should be taken cared with respect for their higher social order and economic status. Therefore, it is important that as described in Chinese values, seniors are taken cared for the earlier economic contribution to the family, as the reciprocal feedback is the shared care supported by their offspring in the old days. The Confucius norms are a self-sufficient system. In modern era, seniors are given little room for decision making in lower social order; however, they contribute through household support like baby-sitting, cooking, gardening, teaching grandchildren, etc., to involve in a reciprocal household care which their children would do for them.

Therefore, focusing merely on the availability of care service would not make shared care service effective. The key is to use apply effective policies of public social support among communities to enable seniors to contribute through social activities and receive the reciprocal interpersonal care service when needed.

This paper presents the model for senior dwellers to contribute in altruism, the setting was based on the assumption that senior society is capable of contributing by social acts and creating new senior economies society. The healthy seniors can be credited by financial entities for their altruistic acts to improve seamless sharing travel environment for the people who suffers from minor or major health problem. The goal is to make those unhealthy people resume back to their earlier healthy state. Their credits of the contributors could be saved for the future possible needs of daily livelihood assistance in the future. The credits are transferrable among individuals as the encouragement of participation. The altruism acts are assumed to increase the health and longevity of seniors to work on providing the travel assistance of the needy people. In this scenario, seniors who enter the stage of ill condition have higher chances of resuming to healthy state with safe and healthy travel modes. The mechanism is illustrated based on the senior age segmentation defined by Wallace and Hirst (1996):

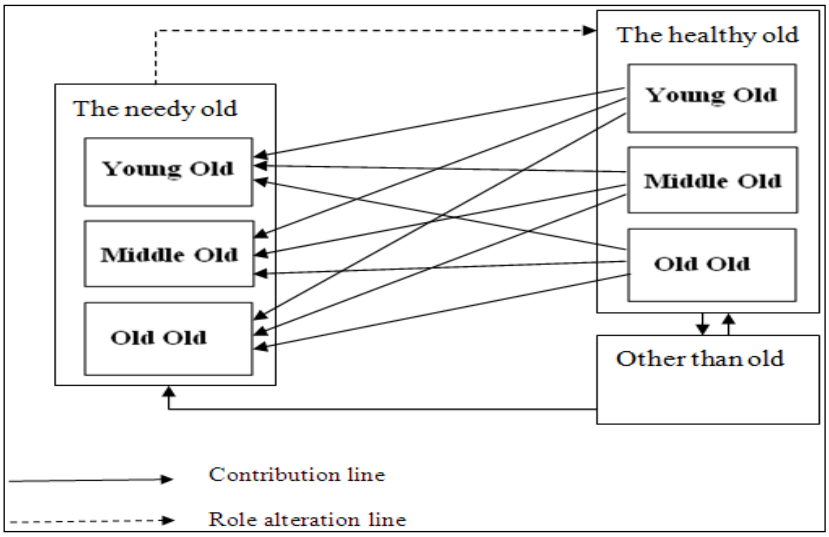

Figure 2 – Reciprocal Altruism Model in old community

Figure 2 is portrayed as factors of the social voluntary activities and their connections. Seniors, regardless of their age, should be valued by their functional segmentation and contribute through their knowledge or abilities to the society. According to Wallace and Hirst (1996), there are significant differences in the quantity demand for various service types among age groups of young-old (65-74 years old), middle-old (75-84 years old), and old-old (85 years old and older), based on transportation capability, income, residence location, sensory impairments, functional activities for daily living of individuals. Young-old group was the biggest activity service users with highest independence for completing multiple daily tasks; middle-old group represented the transitional period, showing increasing heterogeneity of elderly and growing types of health conditions; old-old group had higher risk of functional impairment to take on the tasks like for decision making, transportation, and daily activities, so had to receive the most community-based services for risk reduction and health maintenance.

At this standpoint, any seniors can reciprocate in altruism and alter their role in accordance to their needs and ways of contribution. For example, while middle-old can play better role in sharing their health care and transportation assistance experiences and knowledge; young-old can perform multiple tasks for middle-old and old-old, while earning the contribution credits for the days when needed. This structure is therefore becoming the basis for the build-up of altruistic mode of seamless public and shared transport environment. Here the study begins by locations of cloud system as the fundamental design, to presents the functional characteristics of shared and public transport environment based on the altruistic voluntary social work in cloud service system in the context of Taiwan.

The functionality of metro system and bus system can be planned as the base of cloud service platform of voluntary activities to assist in generating higher flows of public transportation utilization. To amplify the green effect from development of shared transport modes and public transportation system by motivating senior dwellers capability, it is suggested to transform public transportation system into a new role as the physical and intangible platforms of senior social activities for green developments. The altruism benefits through voluntary acts of could be amplified for the subsequent increasing the public

transportation adoption, regional development of the transit-oriented area, and improve the condition of financial deficit of public transport operators.

TAIWAN SMART COMMUNITY DESIGN FOR SEAMLESS TRANSPORT: CLOUD SERVICE SYSTEM

By 2050, there will be 100 million population aged 80 years or older living in China alone, and 400 million people in this age group worldwide (UN 2012). Taiwan, as a geographic neighbor of mainland China, has been growing close ties among the metropolitan regions through the activities perform in cross-strait relations. In 2011, 19 communities in Taiwan have become the members of International Safe Community Network recognized by WHO Collaborating Centre on Community Safety Promotion (WHO CCCSP), which claim to be the ideal communities meeting the safety criteria in households, schools and academic institutions, road networks, agricultural production, aquatic environments, residential areas, and other public events & activities (Karolinska Institute, 2011). Kaohsiung, as a major metropolitan area of Taiwan, has been greeting tourists from China of different age levels with its well-developed metro, bus, bike lane system. It is suggested that, in the households of Taiwan, cloud system service should be provided by building internet based devices into our daily electronic appliance for greater development of senior society.

Interactive Television as Household Interface

The availability of television in Taiwan is apparent. Television is one of the most affordable electronic appliances in the households of rural and urban area of Taiwan that since 1991, the availability of television at households had been more than 99% (Directorate-General of Budget 2010). In Kaohsiung, Taiwan, there were 20.1% of urban elders and 12.8% of rural samples classified with depressive symptoms (Chiu et al. 2005). Seniors in Taiwan spent their most of time at home watching television. Chronic diseases such as cardiovascular diseases and stroke are found to be predictive of depressive symptoms in senior residents of Kaohsiung. Activities of daily living performed were highly correlative with depression in urban and rural seniors in Kaohsiung, Taiwan. It was suggested that toileting and shopping difficulties are to be conquered for the happiness of Kaohsiung senior residents (Chiu et al. 2005). In this aspect, television is no doubt the best interface for seniors to socialize from home.

Carmichael (1999) provided the discussion on the design of interactive television for the elderly. The limitations of cognitive, sensory and physical abilities often arise in the older age and neglected in the design of interactive television service. Learning ability of technological devices to recognize individual demand by familiarized itself with special accents, dialects, eye movement, viewable field, hearing spectrum, are considered to be important since ageing is a continuing process that lower the efficiency of device commandment. It is recognized that humans are the ones who create service devices for elderly care, yet it is the human dominate the concept which follow the changes in human changing behaviors while ageing, marking the importance in the voluntary work development and research should be

in the focus for short-term instant elderly care and long-term technological device improvement.

This study explored the new explanations and connection between mobility and its factors, i.e., activity, health, functional capacity, public support, and economic benefits. In Taiwan, it is recommended could service be provided by the largest telecom cooperation: Chung Hua Telecom. It can serve the community by providing updated information of community activities, such as mother's day celebration party, Chinese New Year reunion gathering, movie watching, cooking party, etc (Fig. 3). Chung Hua telecom also provides home banking system for the convenience of subscriber to pay the bill easily through interactive television (Fig. 4).

Figure 3 - Community Service Platform by Chung Hua Telecom

Figure 4 - Home Banking System provided by Chung Hua Telecom

Refurbished Mobile Phone as Outdoor Interface

The prevalence of mobile phone has been obvious that the penetration of mobile-cellular subscriptions have reached more than 100% since 2001. With the growing demand for the mobile-broadband through smart phones, the development of smart community with the use of mobile-broadband looks promising. Therefore, it is predictable that for the present time, phones which are no longer in use that are functional should be refurbished and recycled for anew reuse purpose. It is assumed that, mobile phones after refurbished, they will be given newer tasks for connecting the people on roads. The emergency system can be exerted by second-hand mobile phone situated in public areas with direct connection to police stations, fire bureaus, hospitals, volunteer information stations, and schools during the events of traffic accidents, earthquakes, floods, typhoons, etc., in rural and urban areas. For example, seniors might constantly forgetting the parking location of bikes, volunteer information stations can develop related bike locating service or bike-sharing services to assist them to complete the tasks. This could be useful for elderly with regards to accessibility of assistance during emergency times. The scheme can also reduce the wastes of unwanted mobile phones and avoid the leakages of toxic wastes from the used mobile phones.

Cloud service system provides seniors at home through interactive televisions and mobile phones with easy connections to the information of different entities, from personal banking account, hospital medication care, kiosks at public transportation stations, to tourist attractions, educational institutes, and social work stations. Banking system can offer the safe and easy foundation for payment procedure and financially stabilize the operation of

public/share transportation which promotes the essential connections between households of voluntary car-sharing/pooling service providers and receivers, while offering real-time information of public transportation system.

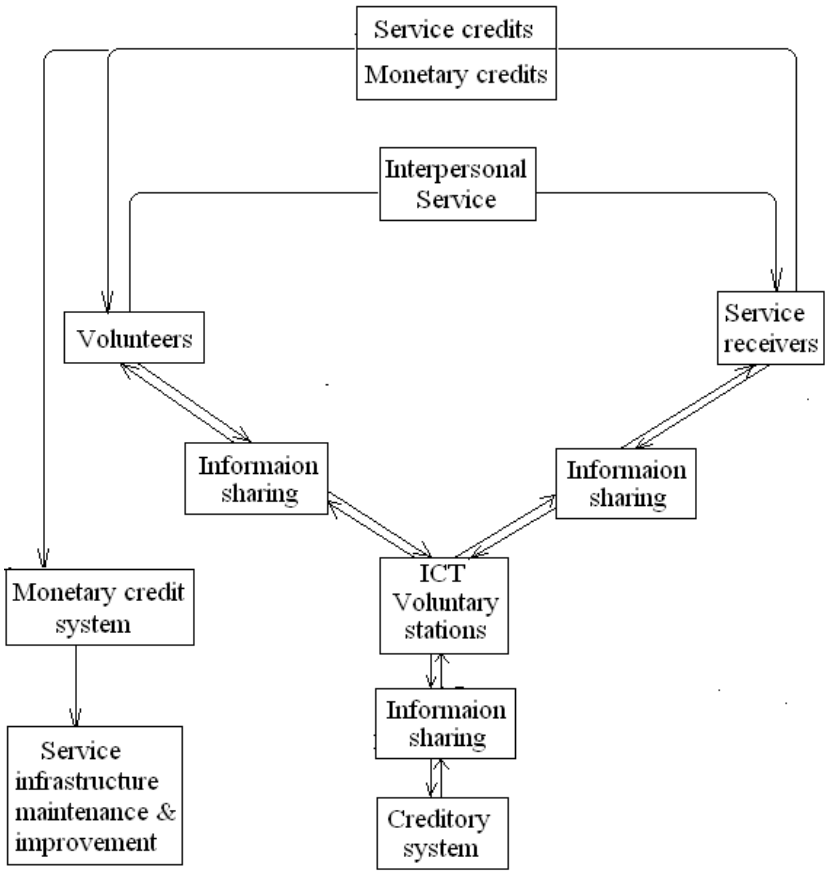

Figure 5 – Service/monetary credit system in voluntary service community

The model shown in Fig. 5 can be expressed by two types of flows: monetary credit flow and service credit flow; as service receives and volunteers exchange information through Information Communication Technology (ICT) platform, voluntary service providers can obtain the service credits in exchange for future needs as voluntary service receivers at no cost; in this system, some service receivers of zero credit balance, who never provided voluntary services or already finishing using the credits, they can provide monetary credits, i.e. service fee, to the system for facilities maintenance and improvements. As emphasized in Fig. 5, there are two basic elements to complete the travel tasks of seniors at home: human forces and technology. Present technological advances already have the ability to increase the speed and safety level of passengers inside the travel tools; however, travelers also need the environment that is safe outside of their travel tools to complete their whole journey. For this reason, the human-based travel assistance can play a crucial role in among all seniors.
Regarding the human-based travel assistance, an integrated design of transport services based on a shared system is recommended for a broader provision of services.
Shared transport service can be generally provided in two forms based on its departure and arrival points: fixed route and door-to-door. In the setting of space and vehicle sharing, Table 1 presents several types of public transport services engaged by voluntary activity participants through Transport Demand Response (TDR) in cloud service system in support of seamless shared/public transport system:

Table I –Seamless transport through in-time cloud system & voluntary service

Space sharing			Fixed route public transport			Door-to-door ridesharing	
Bike lane	Side-walk	parking	Metro LRT	Bus BRT	Taxi-sharing on bus lane	Car-sharing	Car-pooling
Cloud system information service					Cloud system service & voluntary service		

This study suggested another way to improve the mobility of bus in urban area. According to Schramm and Rakotonirainy (2009), when the traffic is less, lane sharing is recommended for improving the transport environment. During the off-peak hours of a day when bus lanes are departing at lower frequency, taxi-sharing services is suggested to improve the performance of public transport system by authorizing taxies to travel on bus lanes to improve the mobility of senior people. This policy could generate stable revenue for taxi industry, lower the fuel expenses of bus operators by canceling the negative net profit departures during the off-peak hours, as well as reduce air pollution by switching to fuel-efficient transport mode, and provide public transport service of greater quality through taxi-sharing. The addition of taxi-sharing to public transport services also creates job opportunities for senior population in the community.

Being praised as one of the five best biking cities in Asia (Lam 2010), Kaohsiung can create an altruistic society through a well-managed sharing system to increase the social benefits, according to the mobility snake model suggested by Hakamies-Blomqvist, Henriksson and Heikkinen (1999), as shown in Fig. 6.

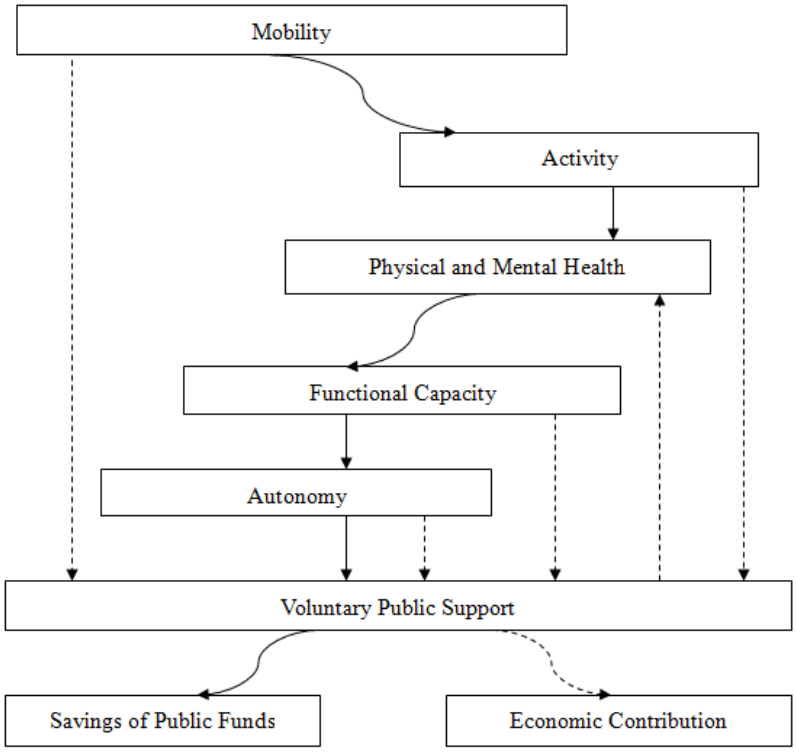

Figure 6 – Connections of smart community in mobility snake

Based on Fig. 6, it can be observed that, in the context of sustainable public support mechanism, this study hypothesizes that with a little public support from voluntary assistance from younger generation in smart community, they improve the activity performance, physical and mental health, functional capacity, autonomy, according to their professions or interests; the assistance from the community could intrigue the other mechanism to motivate senior

dwellers to provide similar public support and contribute multifold of benefits with altruism according to their knowledge, experience, and interests.

DISCUSSION AND CONCLUSION

According to Fraser, Encinosa, and Glied (2008), growing costs of healthcare system pose threats to quality, safety, and accessibility of health service that creates gaps in the society. To reduce the gaps, waste reduction, effective resources allocation, and improvement healthcare delivery efficiency should be implemented (Fraser, Encinosa, and Glied 2008; Clancy 2009). Smart community through cloud system integrating the components of timing, organizations, and markets can play their part for improving the value of healthcare system. Accessibilities of vehicle sharing and rental services will be improved with the assistance of information technology; therefore, real-time interactive information facilities can play a crucial role of matching car sharing providers and consumers, as well as offering the bike rental information for general travelers, physically impaired, and elderly, thus improve the usage of public transportation system.

This paper explored the novel role of senior population for amplify economic output and life quality of an aging society, the study supports the interpersonal assistance practices in reciprocal manners are encouraged. By exploring social caring system for senior dwellers, social activity participation of seniors, and transportation safety issues in aging community, this paper carried out a review study on the issues of household care, healthy travel for social activities engagement, safety and mobility, and reciprocal altruism in public seamless transport through cloud service system. The models of altruism contribution links and travel voluntary assistance system for senior community society in the network of BRT, MRT, and bus system with the space sharing system of bike lane, sidewalk, parking, and vehicle sharing system of fixed-route or door-to-door presents community-based voluntary structure through a reciprocal altruism model.

For a safer community, the bottom-up autonomy mode suggests internationalized information and knowledge connection by individuals to promote reciprocal assistance in communities. In Taiwan, there are more and more international immigrants shift in, require multiple types of supports, such as languages assistance and assistants for business & tour travels. In water connected areas, supports like rescuing service, which are in real-time connection with hospitals, police departments, fire departments, etc. Educational programs on Taiwan transportation system can teach immigrants the techniques of driving, traffic rules, traffic environments, emergency and rescue procedures, etc., while program on languages can provide the understanding about cultural merges, household care for the safety of children and elderly, etc. From this standpoint, senior people in the society can be very informative by spreading local language and cultural background information to the new immigrants, as well as brainstorming different ways of communications for disabled, which can indirectly raise the safety level of the urban environment.

The safety and security aspects of communities in a sharing system can improve the autonomy and health conditions of seniors, and promote the safe use of public and shared transportation. This study suggests the safety measures and sense of security of individuals are the prerequisite of the willingness of traveling. Safety measures, in this study, refer to the infrastructure innovations for walkability & cycliability, and interpersonal assistance. Roads

width shortening is regarded as one of the measures for improve walkability & cycliability. Additionally, comfortableness of walking and cycling is the key element in travel behavior decision; the pedestrian and bike lanes, especially those leading the way up to public transit system, are suggested to provide more tree shades as a safety and comfort element. The security level could be raised by higher adoption of public transportation system in rail and buses through road innovation for built-in of MRT and buses lanes. In another way, interpersonal care offered could be also recognized as the way to raise the security level of individuals.

In an ageing community, people are becoming dependant on distant service to complete their daily tasks. Cloud system service should be provided by building internet based devices into interactive televisions with safe and easy connections to the information of different entities, from personal bank account, hospitals, public transportation time tables, to recreational/educational institutes and voluntary stations. Monetary credits system integrated with banking system can offer the safe and easy foundation for payment procedure and financially stabilize the operation of public/share transportation which promotes the essential connections between households of voluntary car-sharing/pooling service providers and receivers, while offering real-time information of public transportation system. To apply the cloud service pattern which to the rest of world, the first thing is to observe the daily behavior of the people for finding the in-time platform they are most accessible and familiar with. The platform would keep their health records and the personal health information should be accessible to the people who are service providers.

Seniors should contribute by sharing their knowledge and experiences, such as skills of nursing, elderly care, cooking; as well as sharing the space for the activities, tools for learning and assisting, and vehicle for traveling, indicating the crucial role of a sharing system in senior society. The participation of senior people can increase the overall public growth of social welfare, by taking part in offering car-sharing services and roadside tree plantation for urban road environment improvement; the social services participation could raise the awareness to the understanding of the environment and reduce the rate of vandalism of public shared transports.

The system, however, has to meet the essential age-friendly city features according to WHO (2007), which are defined as: (1) safe and clean outdoor spaces at pedestrian crossings and cycle paths; (2) affordable, safe, accessible, and frequent public transportation services for normal and disabled people; (3) sufficient, affordable, and comfortable shelters for frail and disabled older people from the weather with locally services, and (4) accessible venues for individual and social activities by public transportation services.

To strengthen the voluntary system, the healthy seniors can be credited by financial entities for their altruistic acts, including improvements of seamless sharing travel environment for the people who suffer from health problem. The credits of the contributors could be recognized for future livelihood assistance. Those credits are considered to be transferable to the needy, which can be regarded as the motive to encourage the selfless act in the community. Those who do not share through their altruistic acts will obtain social assistance when in need through donation to fund of voluntary community.

By the end of 2011, more than 1 billion mobile-broadband subscriptions worldwide are there, indicating the potential of smart community driven by developing countries with the convenience of mobile gadget (ITU, 2012). However, the used mobile phones are highly

toxic which could cause fatal results in human and environmental health when thrown without proper recycling plans for these phones. Therefore, appropriate uses of the refurbished and recycled phones could greatly improve the connectivity of society in the communities and reduce the cost for the treatment of toxic waste and health risks to human. In this regards, harnessing the habit of the public to recycle the unwanted cellphone at anytime and anywhere is the most critical thing. In Taiwan, safe communities provide recycling boxes at each corner of the convenient stores, shopping malls, and supermarkets which allows a safer and cleaner community environment to live in. It is suggested that, redundant phones which are not in use can be offered as a convenient link outdoors to increase the connectivity of the senior society.

The stereotypes of old people, such as recognizing elderly as social burden, can hinder the public from finding the keys to high quality living and identifying opportunities through their experience and knowledge. This study tries to create opportunities in an ageing society at community level through improving care service and mobility of seniors. This study mainly focuses on the transportation sharing system on space, travel vehicle, and sharing of interpersonal assistance to maximize the contributions of seniors as active participants. It is believed that the voluntary altruism acts in the society can expect greater longevity and more abundant of social and economic resources.

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