



# Social Harmony



## Strategy

| Narrow the digital gap and create digital opportunity



## Management

| LBG assessment of investment in community



## Action

- Telecommunications universal service
- Digital Good Neighbors
- Read with You - Community Network Tutoring
- Portable App for the blind and elderly
- EYE social innovative call center



## Response

| Survey on the demand for 4G of the elderly



## Target

**Short-term** Continue the effort in accessible telecommunication service with the addition of Digital Good Neighbors.

**Long-term** Social investment will reach 1% revenue in 2020



## Indicator

| **GRI** Social investment NT\$910,230 thousand

| **CHT** Digital Good Neighbors 76 locations



## Connect Hope Technology

Chungwa Telecom expects to create an environment without technology and information boundary through telecom technology, so that inheritance of culture, extension of education, promotion of industry and upgrade of arts and intellectual can be connected in the universe of internet, and everyone can be benefited from digital technology despite their age, social standing, geographical location and education, creating infinite hope.

Based on the characteristics of ICT industry and the spirit of "value is where the responsibility lies", Chungwa Telecom penetrates into the communities in Taiwan; with the objective of "shorten digital difference and create digital opportunity", Chungwa observes the trend of digital difference and put forward solutions to facilitate society innovation and digital inclusion.

## 4G Smart City - Accessibility Applications





Chungwa Telecom is currently a participant in MOEA's 4G Smart City Subsidy Program; it has three main focuses for building a smart city and leading the new smart lifestyle, which are: "Convenience," "LOHAS," and "Friendliness." The Friendliness is mainly concerned with "accessibility applications." It involves the use of 4G technology to create a living environment that is caring, friendly, and accessible to people with disability.

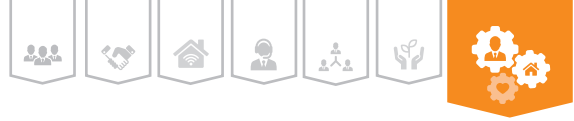
In 2015, this application had already been implemented at locations such as Qingguang Commercial Zone, the section between MRT Zhonghsan Elementary School Station and Technology Development Association for the Disabled, and the section between Tamkang University bus stop and Taipei Resource Center for the Visual Impairment. When persons with visual disability walk along these roads, their cellphones will notify them of the surrounding environment, road condition, or even read out restaurant menus and descriptions to help them shop through ears. The Company has made plans to bring accessibility to 9 MRT stations, 3 streets, and 1 campus in greater Taipei region in 2016. These measures will make life easier for the socially disadvantaged and help build the city's friendly image.

# Digital Inclusion

In the era of technology advancement, the “digital gap” has triggered inequality in education and employment opportunity. Chunghwa Telecom focused its social investment in “narrowing the digital gap” and “creation of digital opportunity”, given the specific nature and the core competence of data communication of the industry we are in. In addition, we also spare no effort in the advocacy of “corporate volunteers” to participate in community service, and proactively assist the communities in creating digital opportunity.



Subject	Strategy	Assessment
 <b>Disabilities</b>	<p>Help disabilities and economically disadvantaged persons to use telecom services through ICT technology and favorable rates; develop ICT equipment and provide the same to the disabilities thereby improve their life quality, education and job opportunities. In addition, with the development of ICT services, we also assist in improving the life quality of people with chronicle disease and aged people who need special care.</p>	<p>Trouble-free communication use, life quality improvement, disadvantaged group employment, social change in the community, and enhance image.</p>
 <b>Low Income Earners</b>	<p>In addition to providing favorable rates to disadvantaged groups, we also install ICT equipment for remote and disadvantaged communities.</p>	<p>Easy to use, affordable rates, life quality improvement, social change inside community, equipment utilization, revenue, and enhance image.</p>
 <b>General Public</b>	<p>Provide learning opportunities through sufficient and comprehensive educational programs. We help users to utilize ICT services, smart communication equipment and value-added service through mobile equipment, our network and branch office.</p>	<p>Course integrity, service course for attentive customer, course utilization, revenue, social changes in community, and enhance image.</p>
 <b>Remote Area</b>	<p>Be it geographical location, distance or outlying islands, ICT service shall not have any boundary. Chunghwa Telecom never ceases to ensure the connectivity of communication. In addition to establishing dual-route in remote areas, we also use satellite to improve the communication quality in mountain area and outlying islands.</p>	<p>Basic communications coverage, high-speed wireless broadband coverage, guarantee of smooth communication, improvement of user life, equipment utilization, revenue, enhance image, social change in the community and community environment.</p>



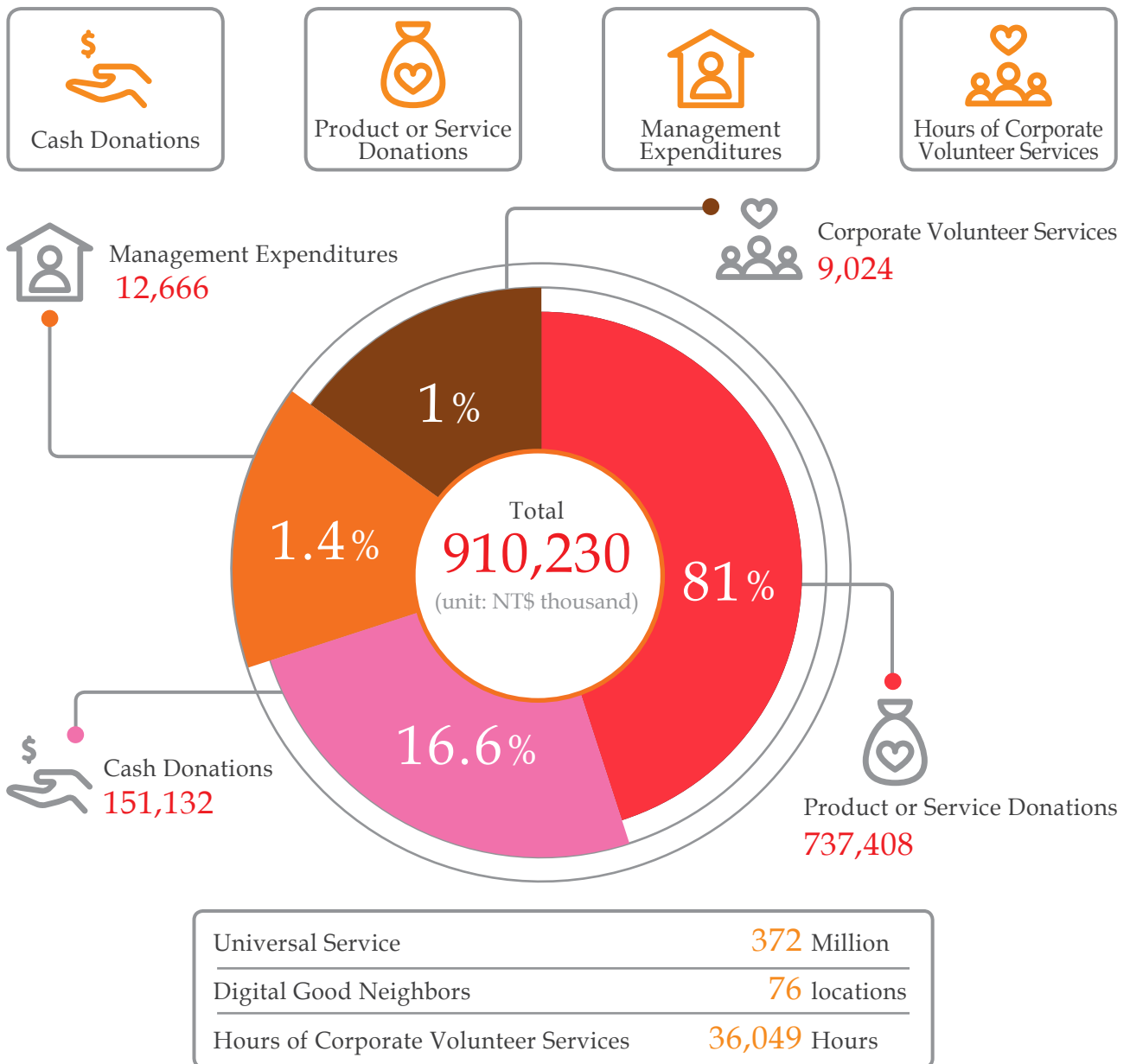
# Social Investment Management G4-22

Chunghwa Telecom believes “Taking from the society and contributing back to the society”. Being the largest telecom carrier in Taiwan, our network and services provided throughout Taiwan and remote islands shapes our self-demanding of contributing to the society. Over the years, by exerting our core competence, we continue to create values for society and help society overall to improve quality of life.

## Quantification of Contribution of Social Investment

By referencing community investment evaluation mechanism of LBG (London Benchmark Group), Chunghwa Telecom conducts evaluation on the possible Community benefits and Business benefits before social investment is made. The quantification of contribution of social investment allows us to make reasonable resources allocation, while avoiding repetition. It helps our future decision-making and promotion of charity or sponsor activities.

### 2015 Type of Social Investment



Note: Calculation for service availability has been adjusted to: “Current year net cost” + “amount allocated from previous year” - “amount approved in previous year” since 2015 to more appropriately present the cost effectiveness of social investments. Therefore, the total amount of investment in 2015 lessened a little bit.

## Digital Good Neighbors, New Cloud Vision



The CHT Foundation is conceived with the spirit of “responsibility” and dedicated to “narrowing digital gap”, “creating digital opportunity”, “assisting local industries”, “cultivation of community life”, and “keep local events on record” as the directions of its work, and enter the communities from the cultural, industrial, living, and education aspects to share the growth together with the communities.

The beauty of Taiwan lies in the 368 towns and districts that make up the nation. We believe each town and district to be unique in its own way, which is why we respect autonomy of our local offices and encourage them to take sustainable actions to the needs of local residents. Due to resource constraints, it is our goal to maximize our influence by exploring needs first before committing resources.

Since 2006, the foundation has been utilizing the core advantages of Chunghwa Telecom to develop “Digital Community” throughout the nation including offshore islands. This program provides local communities with computer classrooms and open space of information to assist people who are willing but lack the resources to learn. Unlike one-time donations, “Digital Community” is a long-term program thoughtfully structured from early planning, equipment deployment, to maintenance.

Each Digital Community is assigned a different purpose; they may be designed to cater for children of disadvantaged families, or to develop local business activities, or to serve local religious organizations. We have accumulated abundant experience from our long-term engagement with the beneficiaries; for this reason, Chunghwa Telecom Foundation continues to organize Digital Communication Meeting on a regular basis to facilitate exchange of experience between different project groups. In 2015, we organized a special “educational tour” that encouraged local residents to step out of their comfort zone and engage directly with residents of Jiashian, Kaohsiung. By seeing and experiencing personally the beauties of others, we hope to inspire growth within the participants themselves.

We have long accompanied local residents and heeded their needs through active interaction. Relationship between the Company and local communities has been founded on the basis of mutual trust and fairness, which we hope to expand and realize further growth within each community. By the end of 2015, we have established a total of 76 Digital Communities; our efforts will endure long into the future and become a part of the local community.

### Digital Message to Home

Digital Communities are being used not just for computer classroom and information exchange, but have also become a gathering place for new immigrants. In 2015, Chunghwa Telecom Foundation introduced tablet courses to the Digital Community program, which gave new immigrants a chance to learn tablet PCs. The program organizer also made publications of new immigrants’ home culture, thus giving them a familiar sight of home and allowing them to pass on cultural legacy to their children.

## Youth Training Scheme

Youth Training Scheme is a program organized between ChungHwa Telecom Foundation and Department of Radio & Television, National Chengchi University that encourages young adults to make real changes in life, step outside of usual circle to experience different things, and learn about themselves and the environment they grow up in through a different perspective. During summer vacations, university students were invited to provide service for 15-20 days at various Digital Communities. They were encouraged to apply what they learned at the local community and at the same time capture local stories on camera.

The 7th “Youth Training Scheme” program received entry from 48 university students, who were assigned to perform service and capture stories at 24 Digital Communities. These students came from different backgrounds, schools and departments, and had devoted themselves to community services by contributing their own specialties such as storytelling, wall arts, creative craft, photography tutoring, cooking lesson, elderly exercise, event recording, journalism and editing class, weaving/dyeing assistance, translation assistance, tour assistance, tribal family photo-taking, remodeling of old houses, and life exploration courses. In the meantime, they captured real and motivating stories through cameras.

The purpose of this program is to share with the public on how the young people see and perceive the stories around them, and in turn motivate others to re-think their connection with the environment and contribute their part. In 2016, we plan to organize a “Story of Falling in love with Taiwan-Photo Exhibition” at selected coffee shops throughout the nation, during which experts will be invited to discuss with participating students to inspire new ideas of how we may care for our local environment.



## New Meanings Discovered by Participants of “Youth Training Scheme”

Duan-Yen Hsieh from National Taipei University of Technology and Ruo-Han Huang from Feng Chia University had applied their architectural expertise and helped turn abandoned school into a gathering place for young people under the guidance of local residents. This building has become an important place to preserve tribal culture and legacy.

Over this program, they found themselves learning more than they could share with locals, and experienced first-hand the difference between knowing and doing. They put their knowledge to the test, witnessed the power of teamwork, and returned home with a broader vision.

*“To accomplish the task, I had to immerse myself in the local culture and to discover what local people need, and to see things from different perspectives.”*

Jin-Ta Chan from Department of Radio & Television and Zi-Hao Lin from Department of Journalism, National Chengchi University were assigned to service at a Paiwan Tribe reserve called “Xinlaiyi.” The two of them started out by interviewing elders about tribal history, and as they astonished locals with the quality portraits they took, they were then asked to take family and ID photos. Photo taking became a major part of their day-to-day activities afterwards, and as they watched the locals dressed up in traditional clothes and wore proud smiles everyday, they started to appreciate the meaning behind their trip. “Many elders lost their photos after the previous Typhoon disaster; therefore they consider photo-taking a meaningful thing to do. We, too, felt happy seeing them smile the way they did, even for such a little thing as pressing a camera.”

After this trip, they received news that one of the elders whom they had taken photo for had passed away. They were asked by locals to edit the photo they took for funeral, and this was the first time they felt the passing of life and a deeper meaning to “photography.”

*“Through photos, we involved ourselves in his life and gave him our blessing for his journeys ahead. Fragile as life may be, we can always offer a bit of decency and warmth to the other.”*

## Connected Resources for Mutual Benefit

Digital Community enable local information exchange at remote locations. Over the course of our efforts, we saw the sparks and possibilities that local residents have exhibited, and hence decided to connect them through the foundation, thereby allow community residents to express voices and seek solutions over a common platform.

Performance art gives children the room to express their imagination, which was why we invited Paper Windmill Theatre to perform at 7 elementary schools located in remote areas such as Dongao (Yilan) and Gaoliao (Hualien). We joined Taiwan Toy Library Association and Homemakers Union in organizing reading courses at seven locations; we invited award-winning singers to Yongle (Pingtung) where they exchanged music talents with local clubs and bands in a successful concert; and last but not least, we bridged support across communities with our Digital Community Program. These accomplishments made us believe that brighter future can be achieved by working with others.



## 2015 Social Contribution of the Foundation

Item	Input of Resources
Digital Learning	2,917
Digital Good Neighbors	4,342
Click Taiwan	6,017
Social Marketing	4,312
CHT Female Basketball Team	13,781
Administrative Expense	11,185

unit: NT\$ thousand

## Create Digital Opportunity

By utilizing our expertise in telecom technology, we hope that everyone shares the advantage of technology despite their wealth, social status or geographical location, thereby achieving the objective of shortening digital difference and creating digital opportunities. We also contributed resources in developing products and services to meet the needs of the disabled, so as to achieving their rights of enjoying the universe of digital technology.

### Telecommunications Universal Service

In 2015, Chunghwa Telecom has established 62 sites for accessibility to telecommunication services in supporting the government for protecting the fundamental right of the people in communication with concrete action.



Beneficiaries of Service

- 84 rural communities in Taiwan
- Telephone service for more than 230,000 households.
- Data communication service for more than 100,000 households.
- More than 64,000 public telephone sets across 22 counties/cities.
- Data connection service for more than 500 high schools, primary schools, and public libraries.

#### Problems

- The topography of different rural zones are vary significantly and far away, which makes the maintenance of the telecommunication systems difficult.
- There is a higher probability that natural disasters will cause damage to the telecommunication facilities, and the cost of maintenance will not be lower than the cost of installation.





## Read with You-Community Network Tutoring



Chunghwa Telecom has supported the education and showed its concern for the rural villages since 2009, after the turmoil left behind by Typhoon Morakot. We extend our service to the permanent settlement and newly developed communities in the disaster zone. Through the installation of visual technology of the Internet, we delivered the educational resources in the form of private tutoring to rural villages and the hands of the unfortunate. We hope to give the children of the next generation a learning environment with “safety, dignity, and hope”!

## Cooperated with Fu Jen University- Rural Villages Network Tutoring Program

### Input ▶ Resource

- From the end of December 2009 to the end of January 2016, a total of NT\$3.3 million and 58,625 tutoring hours.

### Output ▶ Impacts

- The first company in ICT industry to establish collaboration relationship with university, the combination of industry and academic resources to solve long distance tutoring in remote areas.
- Exerting the core competence of communication and corporate advantage of the “Big neighbor” of the society, to help remote schools solving computer maintenance and communication issues.

### Community Benefit

- Exerting corporate core competence, implement the corporate social commitment of “shorten digital difference” and “create digital learning opportunity”.
- Fulfill “Big neighbor” duty to shorten the distance between urban and rural areas through communication technology, and convey warmth between people.

### Business Benefit

- The deepening care helps to open up the dialogue with stakeholders, and establish corporate image in welfare project.
- Combine social resources and minimize the gap of manpower in corporate social welfare.

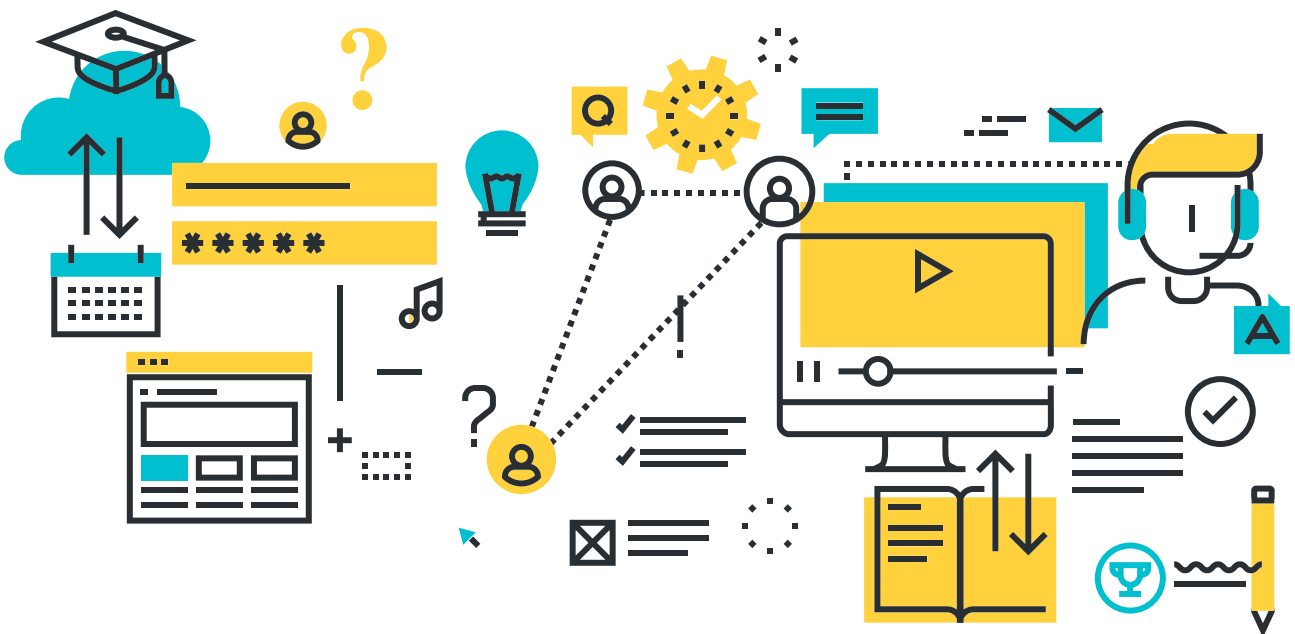
Characteristics	By way of online education, university students assist the pupils of junior high schools and primary schools in the rural villages in enhancing their learning effect and prompt for equal opportunity of learning.
Method	To realize the spirit of stakeholder engagement, we have cooperated with Fu Jen University for online education. University students were called to the cause with one-to-one tutoring to take care of the school children in the rural villages and the disaster zones.
Participants	Chin Lun Hot Spring Tribe in Taitung, Galan Community at Taitung, Pingtung Sunshine Tutoring Association, Pingtung Feng Lin Church, Pingtung Chao Chou Boys Town, Kaohsiung Liu Kuei Catholic Church, Kaohsiung Shan Lin Tzuchi Park, Chiayi Fu Jen High School, Yilan Toucheng Catholic Church, Orchid Island High School and Matzu High School.

Tutorship at Primary School Level	1,617	Tutorship at University Level	2,560
Tutorial Hours	58,625	Tutorship on Summer and Winter Classes	1,433

Note: The data period started on 2009.12.01 and ended on 2016.01.31.

Major result in 2015

- The Ministry of Education organized an “Integrated Learning” event and invited participants of Chunghwa Telecom’s long-distance tuition aid program and the ministry’s e-Tutor partners, comprising of elementary/junior high school students and teachers, to interact face-to-face.
- Following an exhibition of e-Tutor’s “Ten-year Accomplishment,” Chunghwa Telecom was awarded by the Ministry of Education for “Long-term Support of Digital Solutions.”



## Voice-Based Personal Assistance App for the Visually Impaired



In 2013, we launched a “Voice-based Personal Assistance App” that was specifically designed for the visually impaired. The App incorporates image, voice, reading, and lifestyle functions to assist the visually impaired and elders in many difficulties they encounter in life. By the end of 2015, the App had received 10,676 downloads, making it one of the most convenient and useful personal assistant to the visually impaired.

### Result at Present

- In 2014, the iPhone version was released in four languages, offering 30,000 audiobooks and the ability to recognize cash notes of five different countries. Currently, there are 200 volunteers in Taiwan providing service over the cloud to help users identify various items in life.
- In 2015, the iPhone version was added with new features including Internet surfing, 4G mobile learning, hand gesture control, and bookmark. It was the first application to support NCC’s “Accessible Communication Action Plan” and incorporate audio description of images, films, baseball games and other digital contents. It provides the visually impaired with great accessibility to high-speed broadband and digital learning environment.

### Future Target

A 4G-based smart guidance feature will be added to bring live video assistance and Beacon assistance to the visually impaired. Using 4G live video assistance, volunteers can see for the visually impaired and help them resolve problems such as shopping and reading without having to be physically present. The App and volunteers’ assistance have enabled visually impaired persons to experience the world in different ways.



## Senior Citizens App



“Senior Citizens App” was the first application developed by Chunghwa Telecom and Institute for Information Industry that specializes in addressing the needs of the elderly population. The App contains useful features including phone assistance, contact list, caller announcement, weather inquiry, health reminder, emergency contact, photo sharing, and video streaming. Through this App, we hope to make smartphones and tablet PCs more user friendly to elders and narrow their digital divide.

### Result at Present

The Institute for Information Industry later joined HonDao Senior Citizen’s Welfare Foundation in organizing one Chungyang Festival event in Chiayi followed by one family recreational event in Xinzhuang Civil Sports Center, during which senior citizens aged 55 and above were interviewed and invited to experience the App. During the two events, the App was promoted to 400 people, of which 71 had tried to use the App. More than 80% of interviewed elders were satisfied with the App’s overall impression, interface, and functionality.

### Future Target

We hope to complete user experience tests in greater details on 400 elders, and use our findings to optimize the Senior Citizens App and develop long-distance companion features by combining video calls and 4G technology. Doing so would give elders a broader means to interact with the outside world.

Chunghwa Telecom plans to reach the elderly population through government and non-government organizations such as Social and Family Affairs Administration, HonDao Senior Citizen’s Welfare Foundation, Taipei Xiaocheng Residents Association, and Sanmu Riguan Residents Association. It expects to visit 10 community centers and participate in three major charity events, during which an exclusive booth will be established to market, promote, and allow users to experience the App.



## Innovation Creates Employment Opportunity

Chunghwa Telecom has engaged in long-term cooperation with the Resources Center for the Blind at Tamkang University, and has established the EYE Social Innovative Call Center in 2011. The joint effort led to the unveil of the first “Total solution” in Taiwan, including the research and development of the computer assisted telephone system for the visually impaired, improvement and the training and supervision of talents and develop the skills of the telephone customer service personnel in responding to the needs of the visually impaired.

- In 2015, the Company completed an upgrade for Taipei City’s 1999 hotline, making it user-friendly to the visually impaired. This upgrade included: a real-time notification system, a three-way call feature with voice recording, English/Japanese service, verbal abuse referral feature, call duration reminder, health regulation inquiry feature, and quick link to service sub-categories. These upgrades were made to improve the scope and efficiency of services delivered by the customer service personnel.
- By the end of 2015, “Total Solutions” had provided 9 satisfaction surveyors for Chunghwa Telecom and 12 customer service personnel for Taipei City’s 1999 hotline, who process more than 11,525 calls each month. One of the surveyors for the visually impaired had even passed internal assessment and became the head of customer phone service unit.

## Automated Voice Donations

The automated voice donation system developed by Chunghwa Telecom Laboratories continues to prove helpful to charity, social welfare, cultural, educational, and environmental protection institutions, as it provides donors with a more convenient means of donation using cellphones, and has proven to raise more donations than conventional methods. Donors simply need to pick up their cellphones, dial the number and follow instructions as prompted by the voice system to contribute care to those in need. This service had raised NT\$721 million in donations in 2015.

## QR Code-Charity Donation

In 2013, the Company introduced a QR code-based mobile payment service that allows users to make donations more conveniently simply by scanning the appropriate QR Code. This feature enables funds to be raised through a multitude of channels other than convenience stores and websites, while at the same time reduces the amount of manual works. Since its initial launch until the end of 2015, this service was used 401 times and raised NT\$179,028 in donations.



## Preferential Subsidies for the Disadvantaged Groups

Chunghwa Telecom has long been subsidizing telecommunication services for the socially disadvantaged, and assuring their accessibility to basic communication:

Preferential Plan	Preferential Content	Preferential Amount and Benefited People
Public Phone Card Subsidy	<ul style="list-style-type: none"> <li>• NT\$100 IC public phone card for the disadvantaged applicant.</li> <li>• Provides two IC public phone card for visually impaired each year.</li> </ul>	<p>4,533 People</p> <p>2,367 thousand</p>
Caring Series Rate Plan	<ul style="list-style-type: none"> <li>• Double communication hours at original rate plan.</li> <li>• 300 free SMS intra-network and 100 free SMS extra-network.</li> </ul>	<p>-</p> <p>16,297 thousand</p>
Broadband Preferential Plan for Low-income Households	<ul style="list-style-type: none"> <li>• 50% off on HiNet 6M/2M, 20M/5M, 60M/15M monthly rate.</li> <li>• 50% off on ADSL 2M/64K and 5M/384K monthly rate.</li> </ul>	<p>2,188 People</p> <p>9,405 thousand</p>
4G mobile data plan for disabled persons	<p>Disabled persons are entitled to a NT\$200 discount on monthly subscriptions when subscribing to 4G 636 plan and above. During the contract period, users are further entitled to complimentary CHT Wi-Fi Internet access; limited to one account per ID.</p>	<p>-</p> <p>5,001 thousand</p>
Broadband Preferential Plan for the Disabled	<ul style="list-style-type: none"> <li>• 5% off on HiNet 20M/5M and 60M/15M monthly rate.</li> <li>• 15% off on ADS 5M/384K monthly rate.</li> <li>• 5% off for other rates.</li> </ul>	<p>898 People</p> <p>423 thousand</p>
MOD Plan for the Socially Unfortunate	<ul style="list-style-type: none"> <li>• Platform charges: 50% discount (NT\$45/month) for the first 24 months from the work completion date.</li> <li>• Subscribers of family premium package are entitled to 10% discount (amount payable: NT\$243/month; excluding MOD platform charges) for 24 months, and the normal rate after the discount period expires.</li> </ul>	<p>2,967 People</p> <p>Note: The data period started on 2015.1.01 and ended on 2016.5.15</p> <p>1,566 thousand</p> <p>Note: The charges not include the Channel package</p>
Healthy Internet Plan	<p>For low-income households, providing free first year service to protect children from harmful websites such as pornography, violence, suicide, weapons, gambling AND drugs.</p>	<p>112 People</p> <p>133 thousand</p>
Welfare Public Telephone	<ul style="list-style-type: none"> <li>• Installed 110 cm from the floor in public areas for the convenience of the handicapped.</li> <li>• The keyboard was designed with embossment for the visually impaired on the "5" key, and a function for voice adjustment from 3db to 6db that is exclusively prepared for people using hearing aids.</li> <li>• A slot for inserting an IC card is designed on the side of all public telephone sets for the convenience of the visually impaired.</li> </ul>	
Message Relay Service for the Hearing and Speech Impaired	<p>All telephone messages will be translated and faxed to the service hotline 0800-080885. The service personnel will then relay the message in voice and return the message to the hearing and speech impaired caller (up to 80 words for relay and up to 30 words for reply). Those who are not hearing and speech impaired may also call the hotline for the relay of messages via fax to the hearing and speech impaired. The service hours are 08:00-21:00 daily.</p>	



## Table of the Key Associations Jointed by Chunghwa Telecom

G4-16

Chunghwa Telecom has joined almost 100 associations and groups with a view to upgrading its technology and stimulating the development of the industry through exchange and cooperation within the industry and across different industries:

Name of Organization	Note
The Chinese Institute of Electrical Engineering	Present opinions on the telecommunication policy of the government through the telecommunication symposium held by the institute, and sponsor the activities of the institute so as to perform the responsibility of supporting the industry.
Taiwan Intelligent Aerotropolis Association	CHT leads the planning and the operation of the association so as to develop new business opportunities and the industrial prowess of Taiwan, and develop the kind of skills capable of exporting solutions to all parts of the world.
Taiwan Telecommunication Industry Development Association	This is a platform for interchange among the industry peers. With collective consultation and discussion on important issues, this association plays the role as the bridge between the industry and the competent authority.
Chinese International Economic Cooperation Association	CHT delivered speeches on special topics at invitation of the association, and assist in the promotion of international exchange and business joint venture.
TCCDA (Taiwan Customer Service Center Development Association)	Organize seminars frequently and introduce the latest customer service system techniques, operation management, and concept of service and business innovation, which is helpful for CHT to improve its operation management and customer service.
Pacific Telecommunications Council(PTC)	Contact with worldwide telecommunications firms at regular intervals for business deal in nearby locations. This provided substantial result in overseas business expansion.
BCSD Taiwan	Good for the review of sustainable corporate development strategy and the introduction of related management tool, control the dynamics of the international development of CSR issues.
Cloud Computing Association in Taiwan	It helps to get a grip on the information of the government cloud and business opportunity and give recommendations to the government on the cloud industry through the association.
Taiwan Electromagnetic Industry-Academia Consortium	This is a research consortium organized by the university faculties specialized in electromagnetic across Taiwan who have strong potential in the research and development of B4G/5G wireless technology.